



**Application for Water Allocation:
Guidance Document for Public Water
Systems Providing Groundwater to
Municipal Corporations or Priority
Funding Areas in
Carroll, Frederick, and Washington
Counties**

June 2014

Water Supply Program
Water Management Administration



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A. Purpose, Roles, and Responsibilities

In 2008, Maryland legislators passed a law that allows the Maryland Department of the Environment (MDE) to allocate more groundwater to public drinking water systems in Carroll, Frederick, and Washington Counties than would be allocated under previous policies. In response to this law, MDE worked with a stakeholder group to develop this document, which provides guidance to both eligible drinking water systems and MDE permit managers. The goal of this guidance is to provide a systematic methodology for determining whether additional groundwater can be allocated to a water system in a justifiable and sustainable manner that does not negatively impact the water resource or the current or future rights of other property owners to use groundwater associated with their properties. If a public water system wishes to apply for priority allocation, it is the system's responsibility to compile data, conduct analyses, and submit an application with corroborating documentation in accordance with this guidance. MDE will review the application and determine the appropriate allocation in accordance with State laws, regulations, and this guidance.

B. Definitions

In order to clarify the methodology for allocating additional groundwater, specific terms have been devised. This section defines the terms commonly used in this guidance document. These terms are intended to be used specifically within the context of this guidance.

1. **Additional PFA2000 Demand** means an estimate of demand for infill and redevelopment properties within the PFA2000.
2. **Available Groundwater** means the groundwater available for all appropriations, existing and potential, in a given watershed. This is the amount of water that is recharged within the watershed under one-in-ten drought year conditions, taking into account evapotranspiration, 7Q10 base flow for streams, and impervious surfaces. *Available Groundwater* is calculated using methods approved by MDE.
3. **Available Municipal/County Groundwater** means the amount of *Available Groundwater* associated with land owned, controlled, or served by a municipal corporation or county within a PFA.
4. **Available Public Water Supply** means the total amount of water supply available to the Applicant from *Available Municipal/County Groundwater* and the *Safe Yield* of any surface water sources.
5. **Consumptive Groundwater Use** means groundwater which is withdrawn and not returned to an aquifer source in the 12-digit watershed from which the water was withdrawn.
6. **Existing Municipal/County Consumptive Groundwater Use** means an estimate of the amount of *Consumptive Groundwater Use* for existing water uses within a

watershed that are associated with land owned or controlled by any public water system that serves a municipal corporation or PFA.

7. **Existing and Potential Non-Municipal/PFA Consumptive Groundwater Use** means an estimate of the amount of *Consumptive Groundwater Use* for existing and potential water uses within a watershed not associated with land owned or controlled by any municipal corporation or county within a PFA. Potential uses are based on current land use, designated future land uses as specified in the local comprehensive plan, zoning in effect at the time of the application, and the MDE-approved County Water and Sewer Plan in place at the time of the application.
8. **Existing PFA2000 Demand** means an estimate of the average annual drought year water demand (existing at the time of application) for the public water system serving a PFA2000.
9. **Monthly Operating Report** means a report submitted to MDE by public drinking water systems that provides, along with other information, data on the amount of water pumped on a daily basis.
10. **PFA2000** means a PFA that was established on or before January 1, 2000.
11. **Potentially Available Water** means the amount of *Available Groundwater* within a watershed, adjusted to account for existing and potential consumptive uses.
12. **Priority Funding Area (PFA)** means a geographic area established under §5-7B-02 of the State Finance and Procurement Article, Annotated Code of Maryland (2009 Replacement Volume).
13. **Projected Future PFA2000 Demand** means the sum of *Existing PFA2000 Demand* and *Additional PFA2000 Demand*.

14. **Safe Yield** means the maximum amount of surface water that can be withdrawn on a daily basis from a reservoir or a river water source over the duration of a drought of record. It is determined by what comes in (stream flow and precipitation), what goes out (evaporation, seepage, downstream releases, etc.) and the usable stored water within the reservoir system.
15. **Watershed** means the land area draining into a river, river system, or other surface water body. For the purposes of this analysis, *Watershed* refers to the Maryland 12-digit hydrologic unit.
16. **Watershed Groundwater** means 50% of the *Available Groundwater* within a Maryland 12-digit hydrologic unit, adjusted to account for lands owned by the Maryland Department of Natural Resources in accordance with Section G.1. of this guidance. This is the maximum allocable groundwater for the watershed under this guidance.
17. **Withdrawal Report** means a report submitted to MDE by water appropriation permit holders on a semi-annual or annual basis that reports the amount of water withdrawn during the reporting period.

C. Background

This guidance was developed in response to the Laws of Maryland, ch. 197 (2008) (i.e. Brinkley Bill) to address concerns that current policies for allocating water may not allow municipal corporations or PFAs to develop at densities commensurate with goals established in Maryland's Priority Funding Areas Act (1997).

1. This policy provides a methodology for MDE to allocate more groundwater to a public water system that provides groundwater to a municipal corporation or PFA in Carroll, Frederick, and Washington Counties than would be allowed under policies that previously applied to that water system, by:
 - a. Assessing groundwater availability within Maryland 12-digit watersheds;
 - b. Estimating the potential impacts to the resource due to withdrawals by other users based on the actual or reasonably foreseeable consumptive use rather than on their permitted allocations; and
 - c. Allocating groundwater to the public water system which is not directly recharged on land owned or controlled by the municipal corporation or identified as a PFA, provided that all requirements of the water appropriation or use regulations are otherwise met.
2. This policy was developed for the purpose of addressing the water needs for redevelopment and infill within the municipal boundary or PFA established on or before January 1, 2000, not for growth occurring outside of that established area.
3. This policy provides a method for meeting the water needs of public water systems providing groundwater to municipal corporations or PFAs in Carroll, Frederick, and Washington Counties while preserving and protecting the resource.

4. This policy does not supersede requirements that are part of the normal permitting process, including submission of a complete application documenting satisfactory water quality, demonstration of needed demand for the permit period, evidence of the ability of the well(s) to sustainably produce the requested quantities, implementation of water conservation requirements, and, where applicable, protection for Tier 2 watersheds.

D. Applicability of Guidance

Laws of Maryland, ch. 197 (2008) provides MDE with specific authority to allocate more groundwater to public drinking water systems than is allocated under current policies, provided that it will not jeopardize the State's natural resources. This guidance is intended to provide a methodology for meeting water needs as specifically outlined in that law.

1. This policy applies only to public drinking water systems providing groundwater to municipal corporations and PFAs in Carroll, Frederick, and Washington Counties.
2. Only demand for areas within the *PFA2000* will be considered for additional groundwater allocations under this guidance.

E. Evaluating Projected Future PFA2000 Demand

MDE is allowed to allocate additional groundwater to meet water needs for PFA2000 areas. This section provides guidance for determining future demand for these areas.

1. Existing PFA2000 Demand

In this section the Applicant shall evaluate existing demand. Existing demand includes only demand for the *PFA2000* area. Any demand for areas outside of this area is not eligible for additional water allocation.

- a. Estimate the average daily demand on an annual basis for the public water system based on withdrawal reports and Monthly Operating Reports (MORs) for the most recent five-year period preceding the application, reduced to account for leakage greater than 10% of total demand, and/or increased to account for demand reductions due to water restrictions.
- b. Estimate the portion of the demand from E.1.a. associated with areas outside of *PFA2000* boundaries that are currently served by the water system.
- c. Subtract E.1.b. from E.1.a
- d. Increase the demand estimate from E.1.c. by up to ten percent to account for the possibility of additional demand during periods of drought to determine *Existing PFA2000 Demand*.

2. Additional PFA2000 Demand

In this section, the Applicant shall estimate additional demand that could occur if the geographic area within the PFA established on or before January 1, 2000 were fully developed. The Applicant shall take into account current land use, designated future land uses as specified in the local comprehensive plan, zoning in existence at

the time of the application, and the MDE-approved county Water and Sewer Plan in existence at the time of the application. This section provides guidance for estimating water demand in various land use settings for areas within the *PFA2000* boundary that are not currently developed.

- a. Additional residential demand.
 - i. Estimate additional residential demand based on the number of buildable units estimated by or agreed upon by the MDP.
 - ii. Estimate residential demand as 250 gallons per day (gpd) per household.
 - iii. Differing water use criteria will be considered on a case-by-case basis.
 - b. Additional industrial and commercial/institutional demand.
 - i. Estimate industrial demand as 800 gpd/acre.
 - ii. Estimate commercial/institutional demand at 700/gpd per acre.
 - iii. Differing water use criteria will be considered on a case-by-case basis.
 - c. Sum E.2.a. and E.2.b. to determine *Additional PFA2000 Demand*.
3. **Projected Future PFA2000 Demand** is the sum of E.1.d (*Existing PFA2000 Demand*) and E.2.c (*Additional PFA2000 Demand*).

F. Evaluating Available Public Water Supply

This section provides guidance for determining the amount of water allocation the Applicant could receive under policies that apply to all water systems using unconfined aquifers. These policies limit applicants to the amount of water that is effectively recharged on lands the applicant owns or controls. In some cases, water systems are limited by their ability to locate an adequate well and/or by water quality issues that reduce available sources.

1. Calculate Available Municipal/County Groundwater

In this section, the Applicant shall estimate the amount of groundwater that may be allocated with the “water balance” approach that MDE uses to assess water availability. With the water balance approach, MDE estimates the amount of water that is recharged on land owned or controlled by the Applicant under one-in-ten-year drought conditions, taking into account evapotranspiration, 7Q10 base flow for streams, and impervious surfaces.

- a. Available Municipal/County Groundwater* shall be calculated using the water balance methods explained in the Fractured Rock Hydrogeologic Investigation Procedure provided to the applicant by MDE.
- b. Available Municipal/County Groundwater* may be modified by MDE if the Applicant submits documentation of adequate performance and ongoing maintenance for stormwater management technologies that preserve pre-development recharge. This documentation shall include:
 - i.* Written certification by the local authority responsible for oversight of stormwater management within the jurisdiction that the technology is

designed and installed to meet State design guidelines for infiltration specified in the Maryland Stormwater Design Manual¹;

- ii. Maintenance plan approved by the local authority; and
 - iii. Documentation that the municipal corporation or county has assumed authority for verifying the continued performance of the system.
2. Calculate the ***Safe Yield*** of any surface water sources. The ***Safe Yield*** shall not exceed the permitted withdrawal.
 3. **Available Public Water Supply** is the sum of F.1 (***Available Municipal/County Groundwater***) and F.2 (***Safe Yield***) of the Applicant's surface water sources. The ***Available Public Water Supply*** includes the total amount of groundwater available under water balance policies and the total amount of surface water that can be safely withdrawn from existing surface water sources. The ***Available Public Water Supply*** is then compared with the ***Projected Future PFA2000 Demand***.
 4. Compare F.3. (***Available Public Water Supply***) with E.3. (***Projected Future PFA2000 Demand***)

In order for the Applicant to be eligible for additional allocations under this guidance, the total amount of water currently available to the Applicant must be less than the ***Projected Future PFA2000 Demand*** for the water system.

- a. If ***Available Public Water Supply*** is equal to or greater than ***Projected Future PFA2000 Demand***, water will not be allocated above the ***Available Public Water Supply***, except as specified in F.4.c.

¹ MDE guidance documents available at MDE Stormwater Management Program webpages.

- b. If *Available Public Water Supply* is less than *Projected Future PFA2000 Demand*, the Applicant may use this guidance to evaluate potentially available groundwater (See Sections G. and H.).
- c. In some cases, the *Available Public Water Supply* may not be the best available source to provide a sustainable and safe drinking water supply for the community. In such cases, MDE may approve applications under this guidance if the Applicant can demonstrate that previous well exploration attempts in a watershed were unsuccessful or water quality conditions are unfavorable for developing a new water supply. In no circumstance may the Department approve an application that requests an allocation in excess of demand associated with the *PFA2000*.

G. Evaluating Potentially Available Groundwater in Each Watershed

In this section, the Applicant shall assess groundwater availability in each watershed where the Applicant wishes to appropriate additional groundwater. This assessment takes into account the amount of water that is effectively recharged, sets aside a “reserve” for ecological purposes, and accounts for any current and future uses within the watershed. The Applicant may apply for available groundwater from any watershed that falls in whole or part within the PFA2000 boundaries.

1. Watershed Groundwater

Under this guidance, the maximum amount that is available is 50% of the water that is effectively recharged in the watershed. This amount is reduced if more than 50% of the watershed is owned by the Maryland Department of Natural Resources (DNR).

- a. Calculate the *Available Groundwater* for any Maryland 12-digit hydrologic unit that falls wholly or partially within the PFA2000 boundaries. Calculate 50% of this amount. This is the maximum allocable groundwater for the watershed. The 50% “reserve” ensures that sufficient groundwater remains to support ecological needs in the watershed.
- b. Calculate the *Available Groundwater* for the percentage of the watershed that is NOT owned by the Department of Natural Resources. The Department of Natural Resources has established a policy that does not allow MDE to allocate water associated with lands they own.²
- c. The *Watershed Groundwater* is the lesser of G.1.a. or G.1.b.

² John R. Griffin. Policy 2008:10, “Disposition of Water Resources or Water Rights from Lands Owned and Managed by the Department of Natural Resources”. October 17, 2008.

Table 1: Consumptive Use Estimates

Type of use	Estimated gallons per day (GPD) when wastewater is discharged to groundwater in the same 12-digit aquifer	Estimated GPD when wastewater is discharged to a sanitary sewer or to surface water
Lands currently used or designated as agricultural	The greater of 100% of permitted allocation or 50 gpd/acre	N/A
Lands in use or designated as residential on individual wells	40 gpd/unit	250 gpd/unit
Lands in use or designated as residential and served by a community water system	40 gpd/unit	100 % of permitted allocation
Lands in use or designated as commercial, institutional, mixed use, village center, office, or rural business use with a water appropriation permit	15% of permitted allocation	100% of permitted allocation
Lands in use or designated as commercial, institutional, mixed use, village center, office, or rural business use without a water appropriation permit	105 gpd/acre	100% of Available Groundwater
Lands in use as non-agricultural irrigation with a water appropriation permit	100% of permitted allocation	N/A
Lands in use or designated as industrial with a water appropriation permit	Site-specific	100% of permitted allocation
Lands in use or designated as industrial without a water appropriation permit	100% of Available Groundwater	100% of Available Groundwater
All other uses	Site-specific estimates	

2. **Existing and Potential Consumptive Groundwater Uses** in each watershed.

Water must be reserved for all existing and future uses to minimize the potential for adverse ecological impacts. The reserved amount is based on the consumptive use; if water is returned to the aquifer, it is not considered consumptive. In this section,

the Applicant shall estimate all potential consumptive groundwater uses in the watershed. This includes water use by the Applicant, by any other public water system using the same watershed, by existing domestic households, by existing agricultural users, by any existing water appropriation permit holders and by other existing users. In addition, the Applicant shall estimate the additional amount of consumptive water use that could occur if lands are developed, taking into account current land use, designated future land uses as specified in the local comprehensive plan, zoning in effect at the time of the application, and the MDE-approved County Water and Sewer Plan in place at the time of the application. Demand estimates shall be based on whichever of these land use scenarios results in the greatest demand. See Table 1.

- a. Determine ***Existing Municipal/County Consumptive Groundwater Use***
 - i. Determine the total groundwater allocation granted through water appropriation permits to the public water system (Applicant) for all groundwater sources in the watershed.
 - ii. The ***Existing Municipal/County Consumptive Groundwater Use*** is the total groundwater allocation in the watershed less the average annual quantity of municipal/county wastewater that is returned to the groundwater system in the same 12-digit watershed from which the water was withdrawn.
- b. ***Existing and Potential Consumptive Use for Other Municipalities or PFAs***

This step ensures that any water recharged on land owned or controlled by another jurisdiction is not allocated to this Applicant. Calculate the

Available Groundwater for any lands within the watershed that are owned or controlled by a public water system that serves a municipal corporation or PFA not associated with the Applicant. Compare the ***Available Groundwater*** with the groundwater allocation (for sources in the watershed) granted to the municipal corporation or county serving the PFA not associated with the Applicant. The larger of the two values is considered the ***Existing and Potential Consumptive Use for Other Municipalities or PFAs.***

- c. Estimate ***Existing and Potential Non-Municipal/PFA Consumptive Groundwater Uses***

The Applicant is to estimate consumptive groundwater uses (existing and future) for all lands in the watershed not taken into account under paragraphs G.2.a or G.2.b above. Lands owned by the Department of Natural Resources are exempt from the analysis. The Applicant is to estimate consumptive groundwater uses for each of the following general categories: agricultural, residential, commercial/institutional, non-agricultural irrigation, industrial and other. Map(s) of the watershed with current land use, designated future land uses as specified in the local comprehensive plan, current zoning classifications and current MDE-approved water and sewer designations (existing, planned or no-planned categories) shall be submitted with the application. Because existing land uses can be different than the zoning classification, care should be taken not to double count land in two categories. Zoning classification terminology

differs for various jurisdictions, and therefore the zoning terms should not be considered as all-inclusive.

i. Consumptive Agricultural Groundwater Uses

I. Use the larger of the permitted groundwater allocation or 50 gpd/acre for each parcel or group of parcels covered by an agricultural groundwater appropriation permit.

II. For all agriculturally zoned lands without an agricultural groundwater appropriation permit, or lands in agricultural production in non-agriculturally zoned lands, use 50 gpd/acre.

III. If some lands covered by an agricultural groundwater appropriation are not zoned for agricultural use, use either the permitted amount or the estimated consumptive use for the zoning classification, whichever is larger.

ii. Consumptive Residential Groundwater Uses

I. Use 40 gpd for each existing residential unit not within an agriculturally zoned area and outside of the existing or planned water or sewer service areas.

II. Use 250 gpd for each existing residential unit outside the existing or planned water service area, but within an existing or planned sewer service area.

III. Use the permitted groundwater allocation for any community water system outside of any municipal or PFA boundary (e.g. mobile home parks) if wastewater from the community is not returned to the

groundwater system. If wastewater from the community is returned to the groundwater system in the watershed, use 40 gpd for each residential unit for which wastewater is returned to the groundwater system in the watershed. For each residential unit that does not return wastewater to the groundwater system, use the gallons per day per residential unit on which the appropriation permit is based.

IV. Use zoning in existence at the time of the application and the MDE-approved County Water and Sewer Plan in place at the time of the application to estimate future residential units for lands in the watershed.

Do not include lands evaluated under consumptive agricultural groundwater uses, consumptive commercial/industrial uses, consumptive non-agricultural irrigation, or consumptive industrial groundwater uses.

Use 40 gpd per unit for potential residential units outside of an existing or future sewer service area. Use 250 gpd per unit for potential residential units within an existing or future sewer service area.

iii. Consumptive Commercial/Institutional Groundwater Use

I. Use 15% of any groundwater appropriation permit allocation for facilities outside of any existing or planned sewer service area. If the facility discharges its wastewater to surface water, however, then use 100% of the groundwater appropriation permit.

II. Use 100% of any groundwater appropriation permit allocation for facilities within an existing or planned sewer service area or if the facility discharges to surface water.

III. Use 105 gpd/acre for parcels not covered by a water appropriation permit, but zoned commercial, institutional, mixed use, village center, office or rural business and outside an existing or planned water and sewer service area.

IV. Use 100% of *Available Groundwater* for parcels not covered by a water appropriation permit, but zoned commercial, institutional, mixed use, village center, office or rural business and outside an existing or planned water service area, but within an existing or planned sewer service area.

iv. Consumptive non-agricultural irrigation

I. Use 100% of the permitted groundwater allocation for permits issued for non-agricultural irrigation, such as for a golf course.

v. Consumptive Industrial Groundwater Use

I. For existing industries with groundwater appropriation permits, estimate consumptive use based on site/specific reviews. Use 100% of the groundwater appropriation for industries that discharge appropriated groundwater to surface water.

II. For undeveloped parcels zoned industrial and outside the existing or planned water and sewer service area, use 120 gpd/acre.

III. For undeveloped parcels zoned industrial and within an existing or planned sewer service area, use 100% of *Available Groundwater*.

vi. Consumptive Groundwater Use for other categories

I. If other consumptive uses of groundwater, not identified in i. through v. above, are present in the watershed, the Applicant shall estimate these quantities using methods acceptable to the Department. For areas zoned for mineral extraction use rates based on estimates from existing mining operations in similar geologic settings.

vii. *Existing and Potential Non-Municipal/PFA Consumptive Groundwater*

Use is the sum of G.2.c.i, G.2.c.ii, G.2.c.iii, G.2.c.iv, G.2.c.v, and G.2.c.vi.

- d. Differing consumptive water use estimates will be considered on a case-by-case basis.
- e. *Existing and Potential Consumptive Groundwater Uses* is the sum of G.2.a.ii, G.2.b., and G.2.c.vii.
3. *Potentially Available Groundwater* is G.1.c. (*Watershed Groundwater*) less G.2.e. (*Existing and Potential Consumptive Groundwater Uses*).

H. Compare Projected Future PFA2000 Demand with Potentially Available Groundwater

If, based on MDE's review, section G shows that the selected watershed had a positive quantity of *Potentially Available Groundwater* for the Applicant, the Department may allocate up to this quantity to address that portion of the *Projected Future PFA2000 Demand* that is not already allocated under existing permitted allocations and is anticipated to be needed during the permit period.

I. Criteria for Approval of Additional Allocation

This section establishes certain criteria to ensure that the proposed allocation is consistent with Maryland laws, regulations, and policies, to ensure that the proposed use is not wasteful, and to ensure that other municipalities within the watershed have an opportunity to comment on the request.

1. To qualify for the allocation, the application must be consistent with:
 - a. The County's Water and Sewer Plan.
 - b. The public water system's Water Supply Capacity Management Plan³ approved by MDE, if required.
 - c. The Water Resources Element of the local Comprehensive Plan⁴.
2. The Applicant must also meet the following requirements:
 - a. The public water system must conduct a water audit⁵ for MDE approval. If the audit documents water losses in excess of 10%, the public water system must prepare and submit a water loss reduction plan.⁶ This plan must include reasonable timetables for implementation, and, where appropriate, be included in the jurisdiction's Capital Improvement Plan (CIP) projects.
 - b. Documentation must be submitted with the application that the public water system has notified other public water systems serving municipal corporations or PFAs within the same watershed or watersheds of the intention to request additional allocation from the watershed or watersheds.

³ MDE guidance document available at MDE Water Supply Program webpages.

⁴ Guidance document available at Maryland Department of Planning website.

⁵ MDE guidance available at MDE Water Supply Program webpages.

⁶ MDE guidance available at MDE Water Supply Program webpages.

J. Application Submittal

1. Applicant shall use applicable new or renewal permit application forms provided by MDE.
2. Applicant shall submit to MDE's Water Supply Program all supplemental documentation, including data and analyses documenting steps E through I of this guidance and associated maps where appropriate, to support the request for additional allocation.