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New York State Department of Environmental Conservation

Division of Water Technical and Operational Guidance Series

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*** N O T I C E ***

This document has been developed to provide Department staff with guidance on how to ensure compliance with the statutory and regulatory requirements, including case law interpretations, and to provide consistent treatment of similar situations. This document may also be used by the public to gain technical guidance and insight regarding how Department staff may analyze an issue and factors in their consideration of particular facts and circumstances. This guidance document is not a fixed rule under the State Administrative Procedures Act subsection 102(2)(a)(I). Furthermore, nothing set forth herein prevents staff from varying from this guidance as the specific facts and circumstances may dictate, provided staff's actions comply with applicable statutory and regulatory requirements. This document does not create any enforceable rights for the benefit of any party.

I. Summary: This document describes the policies and procedures for incorporating flow-related conditions when issuing Water Withdrawal Permits, pursuant to 6 NYCRR Part 601 ("Water Withdrawal Regulations"). The Water Withdrawal Regulations and Environmental Conservation Law ("ECL") Section 15-1501 encourage the responsible use of water resources, including ensuring adequate supplies of potable water, while protecting aquatic life, habitat function, and best usages. Consistent with ECL § 15-1501 and the Water Withdrawal Regulations, this document outlines procedures that should be followed to ensure that "the proposed water withdrawal will be implemented in a manner to ensure it will result in no significant individual or cumulative adverse impacts to the quantity or quality of the water source and water dependent natural resources, including aquatic life." 6 NYCRR Part 601.11(c)(6). This guidance was developed cooperatively by the Division of Water and the Division of Fish and Wildlife.

II. Policy: It is the policy of the Department that, where applicable and as described in this guidance, permits issued for regulated water withdrawals in New York State should incorporate flow-related conditions to ensure that the proposed withdrawal "will result in no significant individual or cumulative adverse impacts to the quantity or quality of the water source and water dependent natural resources, including aquatic life". 6 NYCRR Part 601.11(c)(6).

The Department manages certain alterations in fresh surface water flow by means of regulations and permit programs targeted to address water quantity and quality issues. This document provides guidance for the review of regulated water withdrawal projects that have the potential to alter the flow of fresh surface waters. Specifically, it describes methods and procedures that when implemented in the permitting process "will protect classified use and assure compliance with applicable water quality standards." 6 NYCRR 601.12(e).

This document does not establish numeric water quality standards for flow in fresh surface waters; rather, it presents a quantitative methodology that has been developed to maintain adequate flow within the waters of the State to protect them for all of their designated best usages.

The Department has authority under the Water Withdrawal Regulations to consider the need for a withdrawal, the adequacy of the source to provide the proposed volume of withdrawal, the availability of alternate sources, and the impact of the proposed project on all affected municipalities with regard to their present and future needs for sources of water supply. The methods and procedures contained in this guidance should generally be followed when incorporating flow-related conditions into water withdrawal permits; however, the Department retains authority to depart from this guidance to account for particular and highly vulnerable aquatic species and habitat and for social, economic, human and exigent needs, including temporary emergency authorizations. Withdrawals that are exempt from permitting requirements are detailed in 6 NYCRR Part 601.9.

III. Background: A new permitting and registration program was required by the amendments to ECL § 15-1501 that were enacted on August 15, 2011. The new legislation required that the Department promulgate regulations to implement a permitting program for water withdrawals of 100,000 gallons or more per day of surface or groundwater. The legislation also provided that those regulations may establish water conservation and efficiency programs as well as quantitative standards that maintain streamflows protective of aquatic life. The required permitting program is implemented by means of the Water Withdrawal Regulations, filed on November 13, 2012. The Water Withdrawal Regulations work to allow the responsible use of water resources while protecting aquatic life, habitat function, and best usages.

IV. Responsibility: The methodologies for determining passby flows and conservation releases were developed through the cooperative efforts of the Department's Division of Fish and Wildlife and Division of Water. An applicant's proposed flow alterations should be evaluated and flow-related permit conditions should be developed by technical staff as described in Section V. The Division of Environmental Permits is responsible for ensuring that water withdrawal permits, along with the flow-related conditions developed pursuant to this guidance, are issued within the statutorily required permitting timeframe (See 6 N.Y.C.R.R. 621.6).

V. Procedure:

A. General: Definitions, Applicability, Limitations, and Projects for which Permits Have Already Been Issued or Initial Permits May Be Issued

1. Definitions

The following definitions will be used for this guidance:

- *Flow* is defined in 6 NYCRR Part 700.1(19). Flow means the volume of water passing through the cross-sectional area of a stream (or river) per unit of time. "Flow" is equivalent to "flow rate".

- *Alteration*: Alteration is defined as the modification of flow in a stream or freshwater wetland by withdrawing water, by the actions of an impounding or diverting structure such that instantaneous streamflow above the structure does not equal streamflow downstream of the structure, or by groundwater withdrawals that modify hydraulically-connected fresh surface water flow.

- *Best usages (uses):* Best usages for each class of water are specified in 6 NYCRR Part 701. This Part also specifies that all fresh surface waters shall be suitable for fish, shellfish, and wildlife survival and propagation (with the exception of Class D waters which will not support fish propagation). The classification of individual bodies of surface water is found in regulation 6 NYCRR Chapter X (Parts 800 - 941), and on the Department's Environmental Resource Mapper (http://www.dec.ny.gov/animals/38801.html).

- *Impair (Impairment)*: To impair means to cause a detrimental impact on the physical, chemical, or biological integrity of a water body such that the designated best usages are not supported. It should be noted that while alterations in flow may result in environmental impacts, not all impacts rise to the level of impairment.

- *Initial Permit*: A water withdrawal permit issued to any person who: operated a water withdrawal system with a capacity equal to or greater than 100,000 gallons per day as of February 15, 2012; reported their withdrawals to the Department pursuant

to ECL Article 15 Title 16 or Title 33 on or before February 15, 2012; is not operating a public water supply; and is not otherwise exempt under 6 NYCRR Part 601. Applications for initial permits are to be submitted to the Department in accordance with a five year schedule that concludes on February 15, 2017. Initial permits are issued pursuant to ECL §15-1501.9 and 6 NYCRR § 601.7.

2. Applicability and Limitations

As stated above, the Water Withdrawal Regulations may establish water conservation and efficiency programs as well as quantitative standards that maintain stream flows protective of aquatic life, even if the proposed withdrawal would not cause an impairment.

3. Existing Water Withdrawal Facilities that are Already Regulated Under a DEC Permit or that May be Issued an Initial Permit

a. New flow or release requirements should generally not be added to Public Water Supply or Water Withdrawal permits that have already been issued, are not included in an initial permit, and generally should not be added when a project for which a permit has already been issued requires a new or modified permit for a proposed action that does not include a new flow alteration, unless the Department determines that a flow related impairment exists in the waterbody from which the permittee withdraws water. In such cases, the Department will incorporate flow related conditions to the permits, in accordance with this guidance. Notwithstanding the above, the Department reserves the right to review the flow and release requirements for such permits in full and amend the conditions of such permits, where appropriate in accordance with 6 NYCRR Parts 601.15 and 621.13 and this guidance.

b. When a project for which a Public Water Supply or Water Withdrawal permit has already been issued requires a new or modified permit for a proposed action that includes a new flow alteration, new flow or release conditions may be incorporated into the permit, but should generally apply solely to the new flow alteration portion of the project unless the Department determines that a flow related impairment exists in the waterbody from which the permittee withdraws water. In such cases, the Department will incorporate flow related conditions to the permits, in accordance with this guidance. Notwithstanding the above, the Department reserves the right to fully review the flow and release permit conditions in such existing permits and modify the conditions of such permits, where appropriate, in accordance with 6 NYCRR Parts 601.15 and 621.13 and this guidance.

B. Multiple Best Usages

All waters in New York State are assigned a classification in 6 NYCRR Chapter X (Parts 800 – 941). Best usages for each class of water are specified in 6 NYCRR Part 701. Most waters support more than one best usage, and it is sometimes the case that regulated flow alterations affect specific best usages differently. In such instances, flow-related permit conditions (described more fully in Section V.E) should be developed on a case-by-case basis which, to the extent possible, protect all best usages while minimizing

negative impacts. Permit conditions should be developed within the context of State policy (ECL § 15-0105) and regulation as follows:

- State policy, declared in ECL § 15-0105.4, provides that due consideration shall be given to the relative importance of different usages.
- State policy, declared in ECL § 15-0105.5, provides that domestic and municipal water supply shall have priority over all other usages.
- Regulated flow alterations should remain protective of endangered or threatened species in accordance with 6 NYCRR Part 182.
- Regulated flow alterations should comply with the Water Withdrawal Regulations (6 NYCRR Part 601).

The Water Withdrawal Regulations seek to ensure the responsible use of water resources while protecting aquatic life, habitat function, and best usages. The Water Withdrawal Regulations allow the Department to consider the impact of a proposed withdrawal on affected municipalities with regard to present and future needs for sources of water supply, while also considering social, economic, and exigent needs. Permit conditions and associated water conservation plans should be developed with the goal of ensuring that no single best usage bears a disproportionate share of the negative impacts during periods of diminished streamflow. The following options are available to protect best usages by encouraging planning, water conservation, and the development of alternate sources:

- Passby flow permit conditions that quantify the availability of water at a given location encourage project planners to site large-volume withdrawals only where they can be supported by the water resource.
- Permit conditions that waive monitoring and passby flow requirements for inconsequential withdrawals (as described in Section V.C.3) encourage project planners to locate on larger waterways or limit proposed withdrawals.
- Permit conditions may specify that withdrawals be reduced to inconsequential levels or suspended entirely during periods of low flow.
- All projects, especially new projects, should be encouraged to develop alternate sources of supply to be used when streamflows are low and waterway withdrawals must be reduced or suspended.
- Water conservation plans associated with the Water Withdrawal Regulations may require contingency plans for decreasing withdrawals and demand during periods of low flow to ensure responsible usage.
- Temporary modifications of flow requirements granted in accordance with the Emergency Authorization provisions of the Uniform Procedures Act (6 NYCRR Part 621.12) should be limited to those public water supplies that cannot rely on an alternate source during periods of low flow. Any modification granted should be conditioned to require water conservation and decreased withdrawal volume while the low flow conditions persist.

C. Alterations that Decrease Flow

The potential for environmental impact and impairment from regulated flow alterations that *decrease* fresh surface water flow should be evaluated during the permit review process. Decreased flows are most likely to result from surface water withdrawals, groundwater withdrawals that affect hydraulically-connected waterways, or hydrologic modifications including the construction of dams or impoundments. In light of these potential environmental impacts, flow alterations should be evaluated on a case-by-case basis using procedures established by this guidance and that are within the existing regulatory framework.

Potential impacts that should be evaluated due to decreased flow include loss of habitat, direct impacts on sensitive life stages, loss of mobility for aquatic organisms, thermal impacts, decreased dissolved oxygen, impacts on wetland hydrology, impacts on recreation and fishing, and decreased quantity of water available for public water supply. Any new flow-related permit conditions should give priority to the best usage of domestic and municipal water supply. (See Section V.B of this guidance.)

Passby Flows and Conservation Releases for New Projects:

When a regulated withdrawal or hydrologic modification decreases the flow in a river or stream, specifying a passby flow or a conservation release is a practical tool for protecting aquatic resources. A passby flow is the quantity of streamflow that should be allowed to pass downstream of a water withdrawal point to support downstream usages. Similarly, a conservation release is the amount of flow that should be continuously released from a dam or impoundment structure to support downstream usages. Passby flows or conservation releases derived using the methodology in Section V.C.3, below, include monthly adjustments which reflect the inherent variability associated with natural flow patterns.

Passby flows or conservation releases may be considered for new projects requiring a Department permit with the exception of projects located in tidal waters or for inconsequential flow alterations, as described in Section V.C.3, below. When a project for which a permit has already been issued requires a new or modified permit for a new or changed flow alteration, passby flows or conservation releases may be considered within the guidelines described in Section V.A.3.b of this guidance. New or modified flow-related permit conditions may also be considered for projects whose flows are controlled by other State or federal regulations or by separately negotiated agreements in which the Department participated when those regulations or agreements are scheduled for re-negotiation.

1. Conservation Releases from Regulated Reservoirs and Impoundment Structures

In instances where it is deemed appropriate to specify a conservation release for a proposed new or modified project, permit conditions should require the release regime,

determined in accordance with Section V.C.3, below, to be maintained continuously from dams and impoundment structures under normal conditions. During periods of low flow, if the inflow to a reservoir or impoundment structure is less than the required conservation release, permit conditions may allow the release rate to be reduced so that outflow equals inflow, less any necessary allowance for public water supply needs. During extended periods of low flow, the permit may require further reductions in release rate and/or implementation of water conservation measures to protect public water supply. (See Section V.B.) Permit conditions should include flow monitoring and reporting requirements, described in Section V.E of this guidance, to demonstrate compliance with such permit conditions.*

(* New flow-related permit conditions and release rates may be limited or waived for dams, impoundments, or other types of hydrologic modifications if such conditions would unreasonably compromise the safe yield of a public water supply, exhaust a significant portion of the additional water supply capacity to be created through a proposed expansion project, or require an unreasonable structural alteration of the release works that is unrelated to the purpose of the new or modified permit.)

2. Passby Flows for Regulated Withdrawals in Rivers and Streams

In instances where it is deemed appropriate to specify a passby flow for a new project, the instantaneous flow determined in accordance with Section V.C.3, below, should be maintained immediately downstream of a water withdrawal point whenever withdrawals are made. Absent other important considerations, regulated withdrawals should be reduced if necessary to maintain the passby flow, reduced to inconsequential levels (as defined in Section V.C.3, below), or suspended whenever the stream flow falls below the passby requirement. Permit conditions should require such withdrawal reductions and include flow monitoring and reporting requirements at regular time intervals, described in Section V.E of this guidance, to demonstrate compliance.

3. Determination of Passby Flows and Conservation Releases for the Design and Review of New Projects

Passby flows and conservation releases derived using the methodology described in this section represent flow management goals that are intended to allow for water withdrawals while providing streamflows that are protective of aquatic life, habitat function, and best usages. The generally applicable methodology uses monthly flow-duration statistics ("percent exceedance flow values") that relate streamflow to the percentage probability that the flow over a period of record will be exceeded. For example, the P70 (70th percentile) flow for a given month is the flow that has been observed to be exceeded 70% of the time during that month over the period of record.

This methodology provides guidance on protection of aquatic life and best usages, but does not define the flow at which impairment occurs. This methodology affords extra protection to sensitive resources by categorizing the waterway at the point of the proposed flow alteration into one of five Classes with different levels of protection based on drainage area or designation as a trout (T) or trout spawning (TS) waterway.

Waterways with sensitive aquatic communities or species are afforded still more protection by allowing them to be considered for inclusion in the more protective Class 1 category. The highest level of protection may be provided by alternative flows determined on a case-by-case basis for a subset of Class 1 waters with very low stream order. All available information should be considered when determining waterway Class and when determining passby flows or conservation releases in waterways with natural flow (paragraph a.1, below), in waterways with altered flow (paragraph a.2, below), or when determining alternative flows (paragraph b, below). With these safeguards in place, and absent any evidence to the contrary, it will be presumed that projects that maintain flows determined using the guidance in these sections will be protective of aquatic life.

No passby flows or conservation releases are required for:

- Tidal waters: Passby flows are not required for regulated projects located in tidal waters including the main stem of the Hudson River below the Troy dam.

- Inconsequential Flow Alterations: If a proposed regulated flow alteration is less than 10 percent of the P95 flow for that month, it may, on a case-by-case basis, be considered inconsequential and no passby flow or conservation release needs to be required for that month unless warranted by cumulative impact considerations, described below. The permit conditions for a project with one or more months of inconsequential flow alterations should include a provision that allows flow-related requirements to be added if needed to address future cumulative impact concerns.

  Whenever possible, the cumulative impact of known flow alterations should be considered during project review. Permits for regulated projects that would otherwise be exempted from monthly passby flows or conservation releases because they are individually considered to be inconsequential may include flow-related permit conditions if the sum of multiple inconsequential alterations exceeds 10 percent of the P95 flow for that month. (In effect, the sum of inconsequential flows should itself be inconsequential if flow requirements are to be waived.)

In instances where it is deemed appropriate to specify a passby flow or conservation release, streamflow requirements should be determined using the methodology described in paragraph a, below. Alternative flows may be approved based on site-specific studies or conditions as described in paragraph b, below.

a. Passby Flow and Conservation Release Methodology: General Case

Watersheds and associated waterways each have distinctive natural flow patterns with variable magnitude, duration, timing, and rate of change of flow rates and water levels. The Natural Flow Regime Method was developed through the cooperative efforts of the Department's Division of Fish and Wildlife and the Division of Water for determining passby flows and conservation releases which preserve the inherent variability associated with a natural flow pattern. The methodology uses monthly flow-duration statistics (also called "percent exceedance flow values") that relate

streamflow to the percentage probability that the monthly flow over a 20 year period of record will be exceeded.

Small watersheds and those that support trout or trout spawning are more sensitive to alterations that decrease flow than larger watersheds. Therefore, when determining passby flows and conservation releases, appropriate levels of protection should be provided by categorizing the waterway at the point of the proposed flow alteration into one of five Classes:

- Class 1: Waterways having a drainage area of less than 10 square miles and all waterways that have been classified T (Trout Waters) and TS (Trout Spawning Waters) regardless of drainage area size. These waterways require the highest degree of protection because they are the most sensitive to adverse impacts. Other waterways that may be considered on a case-by-case basis for the added protection afforded by inclusion in the Class 1 category include:
    - Waterways supporting an aquatic community that exhibits productivity and a diversity of benthic macroinvertebrates or fish equal to a pristine reference waterway.
    - Waterways supporting designated “species of special concern” (6NYCRR Part 182.5(c)) or “species of greatest conservation need” (http://www.dec.ny.gov/animals/9406.html). Endangered and threatened species are considered separately under 6NYCRR Part 182.
    - Waterways with aquatic communities included among the New York Natural Heritage Program’s Significant Natural Communities. Internal Department access to specific data is available through the "Natural Heritage Program Element Occurrence" data layer of the Department's GIS Data Selector. Public information that can be used with a free virtual globe program (such as Google Earth or ESRI's ArcGIS Explorer) is available at http://gis.ny.gov/gisdata/inventories/member.cfm?organizationID=529 by following the “Natural Heritage Community Occurrences” link. Generalized data is available on the Department's Environmental Resource Mapper (http://www.dec.ny.gov/animals/38801.html).
    - Waterways located in a State Wildlife Management Area, State Forest, State Natural Area, or State Park.
- Class 2: Waterways having a drainage area of 10 square miles or greater and less than 50 square miles.
- Class 3: Waterways having a drainage area of 50 square miles or greater and less than 200 square miles.
- Class 4: Waterways having a drainage area of 200 square miles or greater and less than 1,000 square miles.
- Class 5: Waterways having a drainage area of 1,000 square miles or greater.

Waterways with substantial artificial alteration of stream flow by dams, weirs, bypasses, diversions, and water withdrawals or augmentation are different from

waterways without manmade modifications to flow. As such, methods for determining appropriate passby flows and conservation releases are different for waterbodies with "altered flow" and for waterbodies with "natural flow."

In instances where it is deemed appropriate to specify passby flows or conservation releases, the flow requirements should be determined for most of the State in accordance with the methods described in the following sections depending on whether the flow is natural, gaged, ungaged, or altered. Appropriate passby flows and conservation releases for waterways on Long Island should be determined on a case-by-case basis using best professional judgment.

1. Waterways with "Natural Flow"

Waterways that are not subject to substantial artificial modification of stream flow by dams, weirs, bypasses, diversions, or water withdrawals or augmentation as described in paragraph 2, below, will be considered to have "natural flow".

Division of Water staff will determine the magnitude of passby flows and conservation releases in waterways with natural flow. The method for computing passby flows or conservation releases depends on whether the proposed flow alteration is located on a gaged or an ungaged waterway, as described below.

- Gaged Waterways

If a regulated flow alteration is proposed on a waterway with an acceptable reference gage, and if the stream drainage area at the point of the flow alteration is between 50 and 200 percent of the drainage area at the reference gage, then passby flows and conservation releases should be based on weighted monthly percent exceedance flows determined at the point of the flow alteration. Acceptable gages should be located on predominantly unaltered waterways (as defined in paragraph 2, below) and should have a continuous period of record of at least 20 years. Gages whose hydrologic records have minor gaps or slightly shorter duration may be considered if the Division of Water determines that wet, normal, and dry periods are all sufficiently represented. These guidelines were established to reflect recent flow conditions and to be responsive to future changes in streamflow that may result from shifting patterns of land development, upstream water use, and climate change. A list of acceptable gages operated by the United States Geological Survey (USGS) is included in *Technical Methods for Determining Passby Flows for Ungaged Waterways*, (see attachment) developed by the Department's Division of Fish and. Additional gages may be approved by the Division of Water on a case-by-case basis.

Passby flows and conservation releases in gaged waterways with natural flow can be determined as follows:

Step 1: Determine the waterway Class at the point of the proposed flow alteration, as described in paragraph 3a, above.

Step 2: Based on the waterway Class, use Table 1 to identify the appropriate percent exceedance values to be used when calculating inconsequential flows, passby flows, or conservation releases.

Table 1. Monthly Percent Exceedance Values for Determination of Passby Flows, Conservation Releases, and Inconsequential Flows

	Class 1	Class 2	Class 3	Class 4	Class 5
Month \ Drainage Area (square miles)	**<10**	**10 to < 50**	**50 to < 200**	**200 to < 1000**	**≥ 1000**
January	P70	P75	P80	P85	P90
February	P70	P75	P80	P85	P90
March	P70	P75	P80	P85	P90
April	P70	P75	P80	P85	P90
May	P70	P75	P80	P85	P90
June	P70	P75	P80	P85	P90
July	P50	P65	P70	P80	P85
August	P50	P65	P70	P80	P85
September	P50	P65	P70	P80	P85
October	P50	P65	P70	P80	P85
November	P70	P75	P80	P85	P90
December	P70	P75	P80	P85	P90
Inconsequential (% of P95)	10	10	10	10	10

Step 3: Determine the magnitude (cubic feet per second (cfs)) of the monthly percent exceedance flows at an acceptable (as described above) reference stream gage using Appendix A of *Technical Methods for Determining Passby Flows for Ungaged Waterways* or by using daily mean flow observations (accessible for USGS gages at the USGS National Water Information System site: http://waterdata.usgs.gov/ny/nwis/rt) if an alternative gage has been approved.

Step 4: Calculate the magnitude (cfs) of the weighted monthly percent exceedance flows *at the point of the flow alteration* using the drainage area ratio method. This method assumes equal streamflow per unit area at both the reference gage and at the point of the flow alteration for any given month. The weighted percent exceedance flow for a given month is calculated by:

$$P_a = \frac{A_a}{A_g} \times P_g$$

where P_a is the magnitude of the percent exceedance flow at the point of the flow alteration, P_g is the magnitude of the percent exceedance flow at the reference stream gage determined in Step 3, A_a is the drainage area above the point of the flow alteration, and A_g is the drainage area above

the reference stream gage. Watershed drainage areas can be determined using the USGS StreamStats tool accessible at: http://water.usgs.gov/osw/streamstats/ssonline.html.

Step 5: Compare the proposed flow alteration to the monthly flow values calculated in Step 4.

- If the proposed flow alteration is less than 10 percent of the P95 flow for that month, it will be considered inconsequential and no passby flow or conservation release permit condition will be required for that month unless warranted by cumulative impact considerations. (See Section V.C.3.) The permit conditions for a project with one or more months of inconsequential flow alterations should include a provision that allows flow-related requirements to be added if needed to address future cumulative impact concerns.
- If the proposed flow alteration is not inconsequential, permit conditions should specify passby flows or conservation releases taking into account the monthly flows identified in Step 4.

If the proposed flow alteration is located on a gaged stream but the drainage area at that point is not between 50 and 200 percent of the drainage area of the stream at the gage, the passby flow or conservation release guidance should be the higher of the values determined from either the reference gage method (described above) or the regional regression equation for ungaged waterways (described below).

- Ungaged Waterways

Using the regression analysis described in *Technical Methods for Determining Passby Flows for Ungaged Waterways,* the Department's Division of Fish and Wildlife developed equations for estimating monthly percent exceedance flow values for ungaged watershed areas in five hydrologic regions across New York State (Figure 1)[1]. The resulting regression coefficients (Table 2) incorporate the same monthly percent exceedance flow values as are used for gaged waterways.

Passby flows and conservation releases in ungaged waterways with natural flow can be identified as follows:

Step 1: Determine the waterway Class at the point of the proposed flow alteration, as described in paragraph 3a, above.

Step 2: Determine the hydrologic region at the point of the proposed flow alteration using Figure 1.

Step 3: Multiply the upstream drainage area at the point of the proposed flow alteration (determined using the USGS StreamStats tool accessible at http://water.usgs.gov/osw/streamstats/ssonline.html) by the appropriate regional coefficient from Table 2, below, to calculate monthly passby flows,

conservation releases, and inconsequential flows (see Section V.C.3, above) in cubic feet per second (cfs).

Step 4: Compare the proposed flow alteration to the monthly flow values calculated in Step 3.

- If the proposed flow alteration is less than the inconsequential flow for that month, no passby flow or conservation release permit condition will be required for that month unless warranted by cumulative impact considerations. (See Section V.C.3.) The permit conditions for a project with one or more months of inconsequential flow alterations should include a provision that allows flow-related requirements to be added if needed to address future cumulative impact concerns.
- If the proposed flow alteration is not inconsequential, permit conditions should specify passby flows or conservation releases taking into account the monthly flows identified in Step 3.

In a few instances, the upstream drainage area at the point of a proposed flow alteration may extend into multiple hydrologic regions. In those cases, the passby flow or conservation release should be determined on a case-by-case basis.

Figure 1: Hydrologic Regions of New York
Adapted from *Magnitude and Frequency of Floods in New York (USGS 2006)*[1]

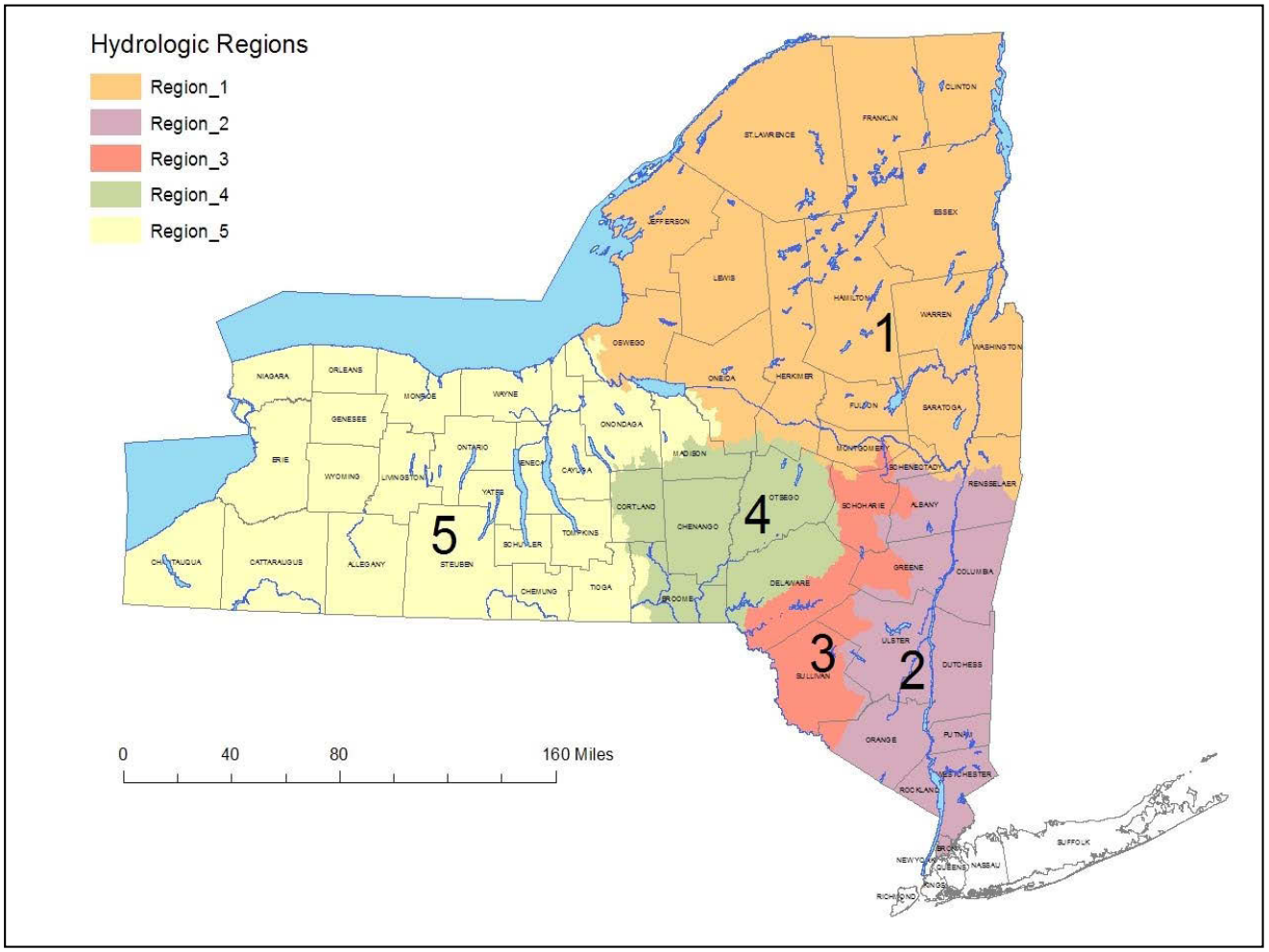

Table 2: Regional Passby Flow Coefficients (cfs/mi^2)

	REGION	CLASS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Adirondack	Class 1	1.018	0.909	1.264	2.729	1.491	0.818	0.719	0.570	0.509	1.047	1.159	1.156
		Class 2	0.950	0.853	1.162	2.510	1.338	0.730	0.590	0.447	0.442	0.758	1.051	1.077
		Class 3	0.869	0.810	1.057	2.305	1.217	0.652	0.544	0.409	0.410	0.687	0.952	1.000
		Class 4	0.799	0.757	0.961	2.078	1.103	0.568	0.457	0.346	0.350	0.569	0.844	0.915
		Class 5	0.719	0.705	0.873	1.835	0.985	0.498	0.414	0.316	0.317	0.512	0.730	0.823
		Inconsequential	0.064	0.063	0.076	0.150	0.086	0.040	0.031	0.026	0.024	0.040	0.059	0.073
2	Lower Hudson	Class 1	1.057	0.993	1.705	1.724	1.032	0.515	0.450	0.331	0.354	0.533	0.725	1.202
		Class 2	0.965	0.896	1.568	1.577	0.941	0.468	0.318	0.208	0.173	0.353	0.636	1.088
		Class 3	0.892	0.798	1.457	1.438	0.847	0.417	0.275	0.174	0.145	0.295	0.525	0.926
		Class 4	0.794	0.726	1.267	1.307	0.771	0.375	0.206	0.124	0.110	0.202	0.415	0.724
		Class 5	0.696	0.652	0.945	1.174	0.701	0.308	0.174	0.106	0.094	0.162	0.284	0.440
		Inconsequential	0.037	0.052	0.073	0.101	0.061	0.025	0.010	0.007	0.006	0.011	0.017	0.030
3	Catskill	Class 1	1.069	0.890	1.594	2.197	1.248	0.626	0.517	0.391	0.440	0.933	1.159	1.381
		Class 2	0.934	0.808	1.373	2.037	1.152	0.556	0.397	0.242	0.278	0.542	0.941	1.207
		Class 3	0.838	0.715	1.276	1.872	1.025	0.499	0.356	0.208	0.240	0.476	0.840	1.109
		Class 4	0.761	0.630	1.142	1.733	0.905	0.442	0.271	0.166	0.176	0.360	0.671	0.977
		Class 5	0.664	0.571	0.984	1.577	0.805	0.376	0.233	0.147	0.156	0.310	0.470	0.823
		Inconsequential	0.055	0.048	0.078	0.139	0.068	0.031	0.016	0.012	0.012	0.021	0.029	0.065
4	Susquehanna	Class 1	1.053	0.913	1.620	1.998	0.897	0.454	0.402	0.368	0.242	0.666	0.780	1.259
		Class 2	0.939	0.844	1.490	1.851	0.812	0.417	0.316	0.205	0.193	0.340	0.636	1.151
		Class 3	0.835	0.779	1.372	1.702	0.734	0.387	0.282	0.178	0.169	0.290	0.536	1.025
		Class 4	0.749	0.728	1.258	1.547	0.670	0.353	0.228	0.144	0.135	0.230	0.447	0.911
		Class 5	0.638	0.672	1.121	1.358	0.598	0.317	0.197	0.132	0.122	0.198	0.282	0.732
		Inconsequential	0.047	0.060	0.079	0.118	0.051	0.023	0.015	0.010	0.010	0.014	0.019	0.048
5	Lake Plains and Southern Tier	Class 1	0.741	0.747	1.468	1.641	0.725	0.352	0.346	0.249	0.257	0.491	0.548	1.091
		Class 2	0.660	0.701	1.338	1.479	0.662	0.323	0.258	0.187	0.178	0.358	0.435	0.975
		Class 3	0.590	0.612	1.191	1.328	0.603	0.284	0.229	0.170	0.156	0.319	0.361	0.859
		Class 4	0.516	0.543	1.048	1.181	0.539	0.248	0.181	0.130	0.124	0.233	0.305	0.708
		Class 5	0.456	0.490	0.935	1.041	0.475	0.217	0.162	0.113	0.107	0.192	0.247	0.595
		Inconsequential	0.039	0.043	0.074	0.089	0.042	0.018	0.012	0.009	0.008	0.012	0.018	0.044

2. Waterways with “Altered Flow”

Waterways will be considered to have “altered flow” if the natural flow pattern (flow rate or temporal pattern) is subject to substantial artificial modification by dams, weirs, bypasses, diversions, withdrawals, augmentations, or other controlled artificial flow modification. Consistent with methods used by the USGS (“Magnitude and Frequency of Floods in New York” [1]), hydrologically-altered

waterways are those where more than 25 percent of the drainage area above a potential reference gage is upstream from a controlled reservoir that alters the natural flow pattern below the structure. Impoundments where inflow from all sources instantaneously equals outflow are not considered capable of altering the stream's natural hydrograph. Additional consideration may be given to flood-control regulation capabilities within a watershed. Watersheds with "usable storage" of more than 4.5 million cubic feet per square mile may be significantly affected by flood detention and therefore may be considered altered. Urbanized waterways may be considered altered if more than 15 percent of the drainage area is affected by manmade changes such as impervious surfaces, culverts, channelization, or diversions.

The methodology used for waterways with "natural flow" (described in paragraph 1 (SectionV.C.3.a.1), above) is not applicable to waterways with altered flow. Passby flows and conservation release permit conditions for withdrawals within altered waterways should be determined by the Department, on a case-by-case basis using best professional judgment and the guidelines provided in Section V.B of this guidance. Wherever possible, passby flows or conservation release permit conditions for altered waterways should include monthly adjustments which reflect the inherent variability associated with the natural flow patterns that would occur in the absence of all artificial flow alterations.

b. Alternative Passby Flows or Conservation Releases

Alternative passby flows and conservation release rates that differ from those determined using the methodology described above may be developed by the Department, on a case-by-case basis under the following circumstances:

- To protect endangered or threatened species in accordance with 6NYCRR Part 182.
- For a subset of Class 1 waterways with very small drainage areas including:
  - Zero order headwaters (e.g., ephemeral streams, seeps, wetlands, and springs in headwater settings).
  - First order or second order headwater streams, as shown on the National Hydrography Dataset (NHD) in GIS format, or a 1:24,000-scale USGS topographic map.
  - Selected Third order headwater streams, as shown on the National Hydrography Dataset (NHD) in GIS format, or a 1:24,000-scale USGS topographic map, satisfying the Class 1 criteria listed in Section V.C.3.a, above.
- When multiple best usages are disproportionately impacted. (See Section V.B of this guidance.)
- To reflect project-specific conditions, such as an instance in which water is withdrawn from a waterway and then discharged immediately downstream with little net flow alteration.
- To address social, economic, human and exigent needs.

In addition, a permit applicant may propose a site-specific passby flow or conservation release based on an alternate methodology that integrates hydrologic and ecological data. (One example of such a method is the Instream Flow Incremental Methodology (IFIM) developed by the United States Geological Survey.)

At a minimum, alternative passby flows and conservation release rates should exceed the monthly $_7Q_{10}$ flow. (The $_7Q_{10}$ flow has typically been used as a design flow for dilution of effluent discharged from wastewater treatment facilities.)

D. Groundwater Withdrawals that Alter the Flow in Fresh Surface Waters

Regulated groundwater withdrawals that alter the flow of hydraulically-connected fresh surface waters should be evaluated during the permit review process. To evaluate regulated groundwater withdrawals, the water levels or flows in nearby fresh surface waters and wetlands should be monitored prior to and during pumping tests as part of the well design/permit application process. 'Pumping Test Procedures for Water Withdrawal Permitting' http://www.dec.ny.gov/lands/86950.html details the pumping test protocol for all public water supply wells. The protocol takes account of seasonal variations, conditions under which the pumping test should be extended, aquifer types, and effects on nearby surface waters. Ideally, no effect on surface water flows should be observable. If an alteration of surface water flow occurs at the proposed rate of groundwater withdrawal, permit conditions may limit allowable withdrawal rates consistent with the passby flows identified using the methods in Section V.C of this guidance. To avoid passby flow requirements, reduction of the proposed withdrawal rate or re-siting of such wells should be considered. Potable water supply wells with a direct hydraulic connection to surface waters will likely need additional treatment as required by the New York State Department of Health.

E. Permit Conditions

Permit conditions to implement the flow-related provisions of the Water Withdrawal Regulations should be developed on a case-by-case basis. When a project for which a permit has already been issued requires a new or modified permit for a new flow alteration, new flow or release requirements may be considered within the guidelines described in Section V.A.3.b of this guidance.

Examples of permit conditions that may be applied include limitations on the rate or rate of change (ramping) of regulated withdrawals, stepped limitations based on flow conditions, contingency measures for limiting water withdrawals during seasonal or drought shortages, establishment of passby flows or conservation releases, and monitoring and reporting requirements. Permit conditions also may account for fact-specific circumstances related to social, economic, human and exigent needs. The permit conditions for projects with inconsequential flow alterations may include flow-related

requirements or a provision that allows such requirements to be added if needed to address future cumulative impact concerns as described in Section V.C of this guidance.

When it is appropriate to include conditions in a permit to implement the flow-related requirements of the Water Withdrawal Regulations, consideration should also be given to both the critical duration of the recommended passby flows and the ability of the person withdrawing the water to respond to rapid variations in stream flow conditions. Some permittees may not need to withdraw water on a daily basis and can more easily adapt to requirements to minimize or cease a water withdrawal when unfavorable stream flow conditions are encountered. However, some businesses, industries and public water supplies that need to withdraw surface water on a daily basis do not have similar options. Thus staff should consider allowing some flexibility during March, April, and May when average flows have been historically large but highly variable with days of low flow interspersed with days of high flow. In those cases, inclusion of Action Levels in permit conditions may be the most appropriate mechanism to implement flow-related requirements.

Action Levels are triggers for the permittee to notify the Department that specified stream flow levels have been reached and to make reasonable efforts to reduce or cease water withdrawals until stream flows once again exceed the Action Level. The permittee must notify the Department within 48 hours of learning that the stream flow has fallen below the Action Level and within 5 days must provide the Department with a written plan that provides the following:

1. expected water withdrawal needs for the next 60 days;
2. identification of any other potential sources of supply that may be used when stream flow is below the action level; and,
3. water conservation methods that can be undertaken to reduce water withdrawal needs.

The permittee shall implement the plan at the direction of the Department. If warranted, the permit may be reopened by the Department for consideration of revised Action Levels or water withdrawal limitations.

Monitoring and Reporting Requirements:

Permit conditions should specify monitoring and reporting requirements to enable and confirm compliance when permit conditions include passby flows, conservation releases, or limitations on regulated withdrawals:

- Passby flows should be maintained continuously. Determinations of allowable withdrawal rates should be made based on comparisons with instantaneous flow data.
- Flow monitoring methods should be determined on a case-by case basis and may include weirs, staff gages, fixed water level markers correlated to flow values, piezometers, or interpolation of flow from acceptable existing gages selected by the

Division of Water. Downstream gages are generally preferred, but nearby upstream gages may be considered. If monitoring at an upstream gage is approved, permit conditions should specify that compliance with passby flows be determined by subtracting the approved maximum instantaneous withdrawal rate from the gaged upstream flow rate. Alternatively, an applicant may be required to install and maintain a new stream gage to measure surface water flow. Case-specific considerations when choosing flow monitoring methods include reliability, verifiability, and level of maintenance required.

- If a passby flow or conservation release is based on data from a USGS gage, then that gage and any applicable interpolation factors should be specified in the permit.
- Permit conditions should require record-keeping and reporting (Microsoft Excel or similar electronic spreadsheet/database formats) to verify that appropriate monitoring was accomplished and flow requirements were satisfied, and should indicate that records are to be retained for a period of no less than five years and are to be submitted to the Department upon request.

Violations and Suspension of Operations:

Consistent with the specific permit conditions, regulated withdrawals should be reduced if necessary to maintain the passby flow, reduced to inconsequential levels, or suspended whenever the stream flow falls below the passby requirement. Failure to submit required reports or requested records, filing of inaccurate or intentionally false reports on water withdrawals, and continuing to withdraw water after a determination that the required passby flow has not been maintained are all examples of separate violations of the permit and the Environmental Conservation Law and may violate the Penal Law.

F. Cumulative Impacts

The cumulative impact of multiple flow alterations is to generally be addressed through the use of appropriate passby flows and conservation releases by each successive, individually regulated activity to protect aquatic life, habitat function, and best usages. (See Section V.C of this guidance.) Regulated flow alterations that would otherwise be exempted from monthly passby flows or conservation releases because they are individually considered to be inconsequential may be subject to flow-related permit conditions if warranted by the cumulative impact of multiple inconsequential flow alterations.

Beyond the Water Withdrawal Regulations, the potential for a proposed flow alteration to contribute to cumulative impacts is assessed more broadly during project review through the State Environmental Quality Review (SEQR) process. Cumulative impacts are considered in the determination of significance of an action using the criteria set forth in 6 NYCRR Part 617.7. In addition, some permit applications, such as for Water Withdrawal and Long Island Well permits, require site-specific evaluation of the impact of a proposed project on neighboring or downstream activities.

VI. Related References:

[1] Figure 1 in this guidance document is adapted from Lumia, Richard, Freehafer, D.A., and Smith, M.J., 2006, Magnitude and Frequency of Floods in New York: U.S. Geological Survey Scientific Investigations Report 2006–5112, 152 pages. (http://pubs.usgs.gov/sir/2006/5112)

Attachments:

ATTACHMENT A - GLOSSARY

ATTACHMENT B - TECHNICAL METHODS FOR DETERMINING PASSBY FLOWS FOR UNGAGED WATERWAYS, DIVISION OF FISH AND WILDLIFE Bureau of Habitat, 625 Broadway, Albany, NY 12233-4756

ATTACHMENT C - Exceedance Values Calculated forReference Gages within Unaltered Waterways

ATTACHMENT D - PASSBY FLOW EXAMPLES

ATTACHMENT A
GLOSSARY

- **Alteration** means the modification of flow in a stream or freshwater wetland by withdrawing water, by the actions of an impounding or diverting structure such that instantaneous streamflow above the structure does not equal streamflow downstream of the structure, or by groundwater withdrawals that modify hydraulically-connected fresh surface water flow.
- **Altered flow** means flow in a waterway where the natural flow pattern (flow rate or temporal pattern) is subject to substantial artificial modification by dams, weirs, bypasses, diversions, withdrawals, augmentation, or other controlled artificial flow modification. See Section V.C.3.a.2 of this guidance.
- **Best usages (best uses)** are specified in 6NYCRR Part 701 for each class of water in accordance with the considerations prescribed by the Environmental Conservation Law.
- **Conservation release** means the flow that must be continuously released from a dam or impoundment structure to support downstream usages during periods when inflow to the impoundment does not instantaneously equal outflow from the impoundment.
- **Cumulative impact** means two or more individual effects on the environment which, when taken together, may compound or increase the other's environmental impact.
- **Department** means the New York State Department of Environmental Conservation.
- **Division** means the New York State Department of Environmental Conservation's Division of Water, unless otherwise specified.
- **Environmental Conservation Law (ECL)** means Chapter 43-B of the Consolidated Laws of the State of New York entitled Environmental Conservation Law. This body of law established the Department and authorizes its programs. The full text of New York's ECL is found on the New York State Legislative Information System. (http://public.leginfo.state.ny.us/lawssrch.cgi?NVLWO:)
- **Exceedance value** means a monthly flow-duration statistic that relates streamflow to the percentage probability that the monthly flow will be equaled or exceeded over a period of record. For example, P70 is the flow that is exceeded 70 percent of the time.
- **Flow** means the volume of water passing through the cross-sectional area of stream (or river) per unit of time. Same as "**flow rate**".
- **Impact** means a change in the physical, chemical, or biological water quality or condition of a waterbody caused by external forces.
- **Impair (Impairment):** Means to cause a detrimental impact on the physical, chemical, or biological integrity of a water body such that the designated best usages are not supported.
- **Inconsequential flow alteration** means a monthly flow alteration or a cumulative monthly flow alteration that is less than 10 percent of the P95 flow for that month. See Section V.C.3 of this guidance.
- **Natural flow** means flow in a waterway that is not subject to substantial artificial modification by dams, weirs, bypasses, diversions, withdrawals, augmentation, or

other controlled artificial flow modification. The flow rate and temporal pattern are reflective of the natural hydrologic cycle. See Section V.C.3 of this guidance.

- **Natural Flow Regime Method** means a quantitative methodology for determining passby flows and conservation releases that are sufficient to prevent impairment and protect aquatic life. The methodology preserves the inherent variability associated with a natural flow pattern and accounts for site-specific conditions requiring enhanced resource protection. See Section V.C.3 of this guidance.
- **New York State Register and Official Compilation of Codes, Rules and Regulations of the State of New York (NYCRR)** means the rules and regulations through which the Department implements and enforces the legislative mandates of Environmental Conservation Law. Links to Department regulations are found at http://www.dec.ny.gov/regulations/regulations.html.
- **P50, P65, P70, P75, P80, P85, P90, or P95** means a monthly flow-duration statistic (also called "percent exceedance flow value") that relates streamflow to the percentage probability that the monthly flow over a period of record will be exceeded. For example, P70 is the flow that is exceeded 70 percent of the time.
- **Passby flow** means the quantity of streamflow that must be allowed to pass downstream of a water withdrawal point to support downstream usages.
- $_{7}Q_{10}$, the "seven-day, ten-year low flow", means a flow statistic used to simulate drought conditions for water quality monitoring. It represents the lowest average flow over a seven day period in a 10-year period of record.
- **Safe Yield** means the maximum amount of water that can be withdrawn from a source without depleting that source during a prolonged drought.
- **Species of Greatest Conservation Need** means species listed in the Department's "Comprehensive Wildlife Conservation Strategy (CWCS)". The complete list can be found at http://www.dec.ny.gov/animals/9406.html.
- **Species of Special Concern** means species listed under 6NYCRR Part 182.5(c).
- **State Environmental Quality Review Act (SEQR)** means Article 8 of the Environmental Conservation Law and 6 NYCRR Parts 617 and 618. SEQR requires environmental impact assessments to identify significant environmental impacts of proposed regulated activities.
- **TOGS (Technical and Operational Guidance Series)** means a series of documents developed to provide Division of Water staff with guidance on how to ensure compliance with statutory and regulatory requirements including case law interpretations, and to provide consistent treatment of similar situations. The complete list of TOGS documents can be found on the Department's website at http://www.dec.ny.gov/regulations/2654.html.
- **United States Geological Survey (USGS)** means the federal agency that, among its other responsibilities, operates and maintains an extensive network of streamflow gages.

Attachment B

Technical Methods for Determining Passby Flows

September 3, 2015

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

TECHNICAL METHODS FOR DETERMINING PASSBY FLOWS FOR UNGAGED WATERWAYS

DIVISION OF FISH, WILDLIFE, AND MARINE RESOURCES
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Technical Methods for Determining Passby Flows for Ungaged Waterways

Regional Regression Determination

To determine monthly flow statistics at ungaged locations throughout New York State, regression analyses were conducted using existing daily streamflow data from United States Geologic Survey (USGS) gage stations located within unaltered streams. The watersheds containing these gages were grouped into 5 separate hydrologic regions in New York, excluding Long Island (see Figure 1). The hydrologic regions, as adopted from the 2006 USGS report “Magnitude and Frequency of Floods in New York”, were selected based on similarities in the five basin characteristics that were found to have the greatest influence on daily streamflow. The greatest effect was determined to be the size of the drainage area. Thus, when conducting our analyses, we assumed that instream flow at any given point on a waterway would be a function of the drainage area of the unaltered watershed located upstream of that point.

USGS Gage Station Selection

The daily streamflow data used in this analysis came from USGS gages in streams that were unaltered; that is, the flow pattern at those gages were representative of the natural hydrograph. Consistent with methods used by the USGS, hydrologically-altered waterways were those where more than 25 percent of the drainage area above a potential reference gage was upstream from a controlled reservoir that altered the natural flow pattern below the structure. Impoundments where all sources of inflow instantaneously equals outflow were not considered capable of altering the stream’s natural hydrograph. Additional consideration was given to the flood-control regulation capabilities within a watershed. Watersheds with "usable storage" of more than 4.5 million cubic feet per square mile were considered significantly affected by flood detention and therefore were classified as altered. Urbanized waterways were considered altered if more than 15 percent of the drainage area was affected by manmade changes (e.g. impervious surfaces, channelization, diversions, culverting, etc.).

Once unaltered watersheds were identified, the use of these gages in the regression analyses was generally limited to those where the drainage area was greater than 50 square miles, and having a hydrologic record of at least 20 recent years. All data sets were limited to the period January 12, 1990 through December 31, 2009. These limitations were established to reflect current surface water flow conditions and to be responsive to potential future changes in streamflow that may result from shifting patterns of land development, upstream water use, and/or climate change. In hydrologic regions where very few gages met either of these criterions, additional gages with either slightly smaller drainage areas or smaller periods of recent flow record were used. Some gages were considered which possessed minor gaps in the hydrologic records as long as the resulting data was representative of recent flow patterns. In all, daily flow values from 70 USGS gages were used in the analysis (see Table 1). Gages from neighboring states including Pennsylvania, Vermont and Connecticut were used to provide daily streamflow statistics for boundary waters.

Hydrologic Region 5 is a combination of two hydrologic regions as were originally identified in the 2006 USGS report “Magnitude and Frequency of Floods in New York.” This region was originally split between the Southern Tier and the Lake Plains regions of western New York. They were combined because of the near lack of gaged unaltered waterways in the lake plains region. The operations of the New York State Barge Canal results in modification to the natural flow patterns in most waterways that flow north from the Finger Lakes. The number of available gages on unaltered streams was insufficient to conduct regression analyses. This resulted in the formation of a single region referred to as “Western NY.”

Monthly Exceedance Estimates

Monthly flow exceedance values were determined for each of the reference gages within the unaltered waterways (See Appendix A). They were then plotted separately against the size of the drainage area at the respective gage locations within each hydrologic region. Trend lines were plotted and the linear regression equations provided coefficients to determine the monthly flow exceedance values for a drainage area of any size within each of the five hydrologic areas. Monthly coefficients corresponding to the appropriate passby flow requirements from Division of Water Technical and Operational Guidance Series (TOGS) 1.3.12 are presented in Table 2 for each of the hydrologic regions and stream classes (discussed below). Monthly passby flows and inconsequential flows, as measured in cfs/mi², can be approximated for any point on most ungaged, unaltered stream in New York State by multiplying the size of the drainage area located upstream of the point by the appropriate set of monthly regional regression coefficients. In rare instances where the upstream drainage area extends into multiple hydrologic regions, the passby flow must be determined on a case-by-case basis.

Stream Classification

Small watersheds and those that support trout or trout spawning are more sensitive to alterations that decrease flow than larger watersheds. Therefore, when determining passby flows and conservation releases, appropriate levels of protection should be provided by categorizing the waterway at the point of the proposed flow alteration into one of five classes:

Class 1: Waterways having a drainage area of less than 10 square miles and all T (Trout Waters) and TS (Trout Spawning Waters) regardless of drainage area size. These waterways require the highest degree of protection because they are the most sensitive to adverse impacts. Other waterways that may be considered on a case-by-case basis for the added protection afforded by inclusion in the Class 1 category include:

- Waterways supporting an aquatic community that exhibits productivity and a diversity of benthic macroinvertebrates or fish equal to a pristine reference waterway.
- Waterways supporting designated “species of special concern” (6NYCRR Part 182.5(c)) or “species of greatest conservation need.”
- Endangered and threatened species are considered separately under 6NYCRR Part 182.
- Waterways with aquatic communities included among the New York Natural Heritage Program’s Significant Natural Communities.
- Waterways located in a State Wildlife Management Area, State Forest, State Natural Area, or State Park.

Class 2: Waterways having a drainage area of 10 square miles or greater and less than 50 square miles.

Class 3: Waterways having a drainage area of 50 square miles or greater and less than 200 square miles. These waterways may be less sensitive to flow alterations due to their moderate size.

Class 4: Waterways having a drainage area of 200 square miles or greater and less than 1,000 square miles.

Class 5: Waterways having a drainage area of 1,000 square miles or greater.

Figure 1. Hydrologic Regions of New York. as adopted from "Magnitude and Frequency of Floods in New York" (USGS 2006).

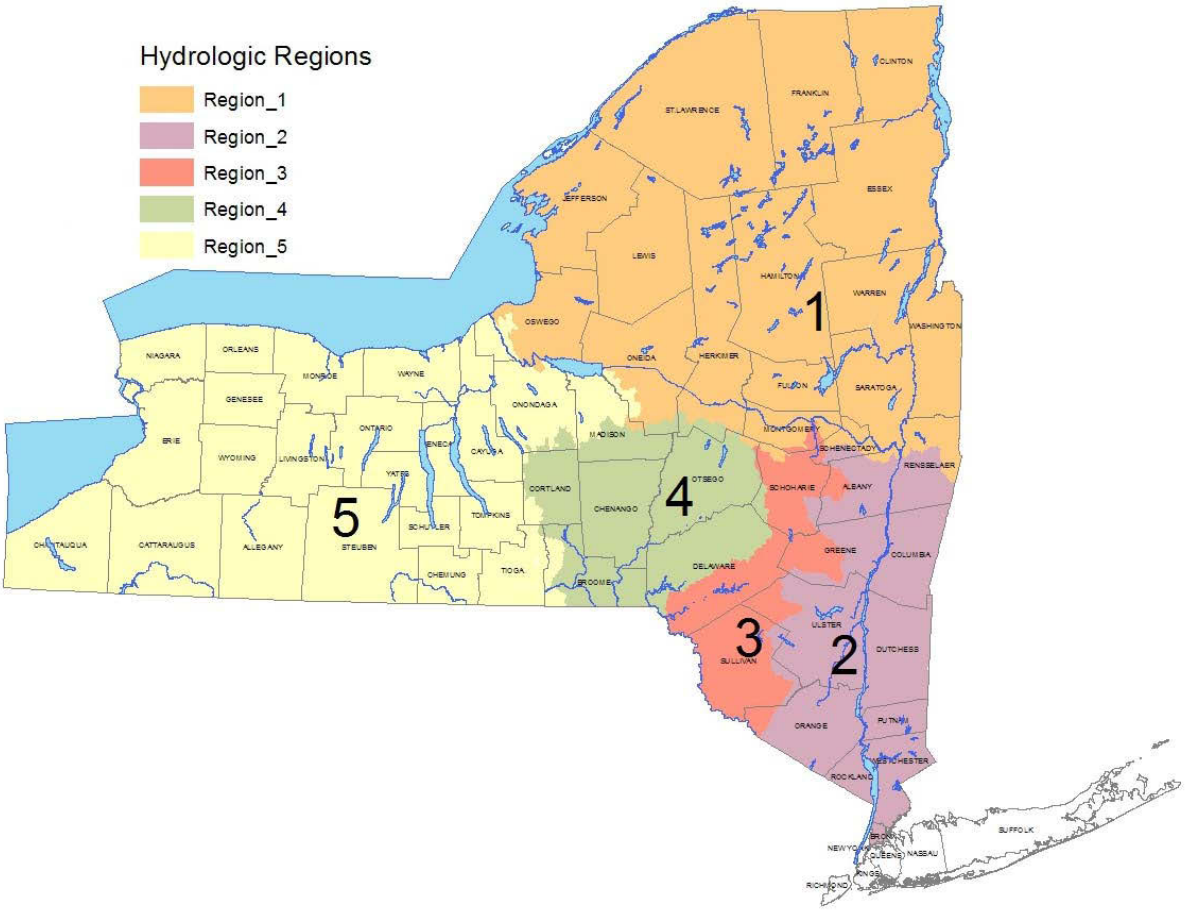

Table 1. Reference USGS Gage Stations Located On Unaltered Streams

Site No.	USGS Gage Station Name	DEC Region	Data Set Range	Total Years	Drainage Area (mi^2)
Region 1 (Adirondacks)					
04271815	Little Chazy River near Chazy NY	5	Mar 90-Dec 09	20	50
04276842	Putnam Creek East of Crown Point Center NY	5	Mar 90-Dec 09	20	52
01349150	Canajoharie Creek near Canajoharie NY	4	Mar 93-Dec 09	17	60
04273700	Salmon River at South Plattsburgh NY	5	Mar 90-Dec 09	20	63
04273800	Little Ausable River near Valcour NY	5	Jan 92-Dec 08	17	68
04256000	Independence River at Donnattsburg NY	6	Jan 90-Dec 09	20	89
04270200	Little Salmon River at Bombay NY	5	Jan 90-Dec 09	13	92
04250750	Sandy Creek near Adams NY	6	Jan 90-Dec 09	13	137
04280450	Mettawee River near Middle Granville NY	5	Jan 99-Dec 09	11	167
04268800	West Branch St. Regis River near Parishville NY	6	Jun 91-Dec 09	18	171
04280000	Poultney River below Fair Haven, VT	VT	Jan 90-Dec 09	20	187
04262500	West Branch Oswegatchie R near Harrisville NY	6	Jan 90-Dec 09	20	258
04276500	Bouquet River at Willsboro NY	5	Mar 09-Dec 09	20	270
01329490	Batten Kill below mill at Battenville NY	5	Apr 98-Dec 09	12	396
04275500	Ausable River near Au Sable Forks NY	5	Mar 90-Dec 09	20	446
01321000	Sacandaga River near Hope NY	6	Jan 90-Dec 09	20	491
01334500	Hoosic River near Eagle Bridge NY	4	Jan 89-Dec 08	20	510
04273500	Saranac River at Plattsburgh NY	5	Jan 99-Dec 09	20	608
04269000	St. Regis River at Brasher Center NY	6	Jan 90-Dec 09	19	612
Region 2 (Lower Hudson)					
01362497	Little Beaver Kill at Beechford near Mt Tremper	3	Oct 97-Dec 09	12	17
01374890	Cross River near Cross River NY	3	Dec 95-Dec 09	14	17
01365500	Chestnut Creek at Grahamsville NY	3	Jan 99-Dec 09	11	21
01362370	Stony Clove Creek below Ox Clove at Chichester	3	Jan 97-Dec 09	13	31
01365000	Rondout Creek near Lowes Corners NY	3	Jan 90-Dec 09	20	38
0137449480	East Branch Croton River near Putnam Lake NY	3	Oct 95-Dec 09	14	62
01362200	Esopus Creek at Allaben NY	3	Jan 90-Dec 09	20	64
01372500	Wappinger Creek near Wappingers Falls NY	3	Jan 89-Dec 08	20	181
01200000	Tenmile River near Gaylordsville, CT	CT	Jan 92-Dec 09	18	203
Region 3 (Catskill)					
01434017	East Br Neversink River near Claryville NY	3	Jan 92-Dec 09	18	23
01414500	Mill Brook near Dunraven NY	4	Jan 90-Dec 09	20	25
01349810	West Kill near West Kill NY	4	Oct 97-Dec 09	12	27
01350080	Manor Kill at West Conesville near Gilboa NY	4	Jan 90-Dec 09	20	32
01415000	Tremper Kill near Andes NY	4	Jan 90-Dec 09	20	33
01434498	West Branch Neversink River at Claryville NY	3	Jan 92-Dec 09	18	34

Site No.	USGS Gage Station Name	DEC Region	Data Set Range	Total Years	Drainage Area (mi^2)
Region 3 (Catskill), continued					
01414000	Platte Kill at Dunraven NY	4	Dec 96-Dec 09	13	35
01349700	East Kill near Jewett Center NY	4	Jan 97-Dec 09	13	36
01413398	Bush Kill near Arkville NY	4	Oct 97-Dec 09	12	47
01435000	Neversink River near Claryville NY	3	Jan 90-Dec 09	20	67
01413408	Dry Brook at Arkville NY	4	Jan 97-Dec 09	13	82
01349705	Schoharie Creek near Lexington NY	4	Jan 99-Dec 09	10	97
01413500	East Branch Delaware River at Margaretville NY	4	Jan 90-Dec 09	20	163
01350000	Schoharie Creek at Prattsville NY	4	Jan 90-Dec 09	20	237
01420500	Beaver Kill at Cooks Falls NY	4	Jan 90-Dec 09	20	241
Region 4 (Susquehanna)					
0142400103	Trout Creek near Trout Creek NY	4	Jan 97-Dec 09	13	20
01422747	East Brook East Of Walton NY	4	Jan 99-Dec 09	11	24
01422500	Little Delaware River near Delhi NY	4	Jan 97-Dec 09	13	50
01421900	W Br Delaware River Upstream From Delhi NY	4	Aug 97-Dec 09	13	134
01510000	Otselic River at Cincinnatus NY	7	Jan 90-Dec 09	20	147
01509000	Tioughnioga River at Cortland NY	7	Jan 90-Dec 09	20	292
01423000	West Branch Delaware River at Walton NY	3	Jan 90-Dec 09	20	332
01502500	Unadilla River at Rockdale NY	6	Jan 90-Dec 09	14	520
01500500	Susquehanna River at Unadilla NY	4	Jan 90-Dec 09	20	982
01512500	Chenango River near Chenango Forks NY	7	Jan 90-Dec 09	20	1483
01503000	Susquehanna River at Conklin NY	7	Jan 90-Dec 09	20	2232
Region 5 (Western NY)					
04233300	Sixmile Creek at Bethel Grove, NY	7	Mar 95-Dec 09	15	39
01518862	Cowenesque River at Westfield, PA	PA	Jan 90-Dec 09	20	91
03021350	French Creek near Wattsburg, PA	PA	Jan 90-Dec 09	20	92
04215000	Cayuga Creek near Lancaster NY	9	Jan 90-Dec 09	20	96
01525981	Tuscarora Creek above South Addison NY	8	Jan 90-Dec 09	20	102
04234000	Fall Creek near Ithaca NY	7	Jan 90-Dec 09	20	126
04215500	Cazenovia Creek at Ebenezer NY	9	Jan 90-Dec 09	20	135
04214500	Buffalo Creek at Gardenville NY	9	Jan 90-Dec 09	20	142
03007800	Allegheny River at Port Allegany, PA	PA	Jan 90-Dec 09	20	248
04221000	Genesee River at Wellsville NY	9	Jan 90-Dec 09	20	288
04213500	Cattaraugus Creek at Gowanda NY	9	Jan 90-Dec 09	18	436
01529500	Cohocton River near Campbell NY	8	Jan 90-Dec 09	20	470
03010500	Allegheny River at Eldred, PA	PA	Jan 90-Dec 09	20	550
04223000	Genesee River at Portageville NY	9	Jan 90-Dec 09	20	984
04227500	Genesee River near Mount Morris, NY	8	Jan 90-Dec 09	20	1424
03011020	Allegheny River at Salamanca NY	9	Jan 90-Dec 09	20	1608

Table 2: Regional Passby Flow Coefficients (cfs/mi^2)

Region		CLASS*	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Adirondack	Class 1	1.018	0.909	1.264	2.729	1.491	0.818	0.719	0.570	0.509	1.047	1.159	1.156
		Class 2	0.950	0.853	1.162	2.510	1.338	0.730	0.590	0.447	0.442	0.758	1.051	1.077
		Class 3	0.869	0.810	1.057	2.305	1.217	0.652	0.544	0.409	0.410	0.687	0.952	1.000
		Class 4	0.799	0.757	0.961	2.078	1.103	0.568	0.457	0.346	0.350	0.569	0.844	0.915
		Class 5	0.719	0.705	0.873	1.835	0.985	0.498	0.414	0.316	0.317	0.512	0.730	0.823
		Inconsequential	0.064	0.063	0.076	0.150	0.086	0.040	0.031	0.026	0.024	0.040	0.059	0.073
2	Lower Hudson	Class 1	1.057	0.993	1.705	1.724	1.032	0.515	0.450	0.331	0.354	0.533	0.725	1.202
		Class 2	0.965	0.896	1.568	1.577	0.941	0.468	0.318	0.208	0.173	0.353	0.636	1.088
		Class 3	0.892	0.798	1.457	1.438	0.847	0.417	0.275	0.174	0.145	0.295	0.525	0.926
		Class 4	0.794	0.726	1.267	1.307	0.771	0.375	0.206	0.124	0.110	0.202	0.415	0.724
		Class 5	0.696	0.652	0.945	1.174	0.701	0.308	0.174	0.106	0.094	0.162	0.284	0.440
		Inconsequential	0.037	0.052	0.073	0.101	0.061	0.025	0.010	0.007	0.006	0.011	0.017	0.030
3	Catskill	Class 1	1.069	0.890	1.594	2.197	1.248	0.626	0.517	0.391	0.440	0.933	1.159	1.381
		Class 2	0.934	0.808	1.373	2.037	1.152	0.556	0.397	0.242	0.278	0.542	0.941	1.207
		Class 3	0.838	0.715	1.276	1.872	1.025	0.499	0.356	0.208	0.240	0.476	0.840	1.109
		Class 4	0.761	0.630	1.142	1.733	0.905	0.442	0.271	0.166	0.176	0.360	0.671	0.977
		Class 5	0.664	0.571	0.984	1.577	0.805	0.376	0.233	0.147	0.156	0.310	0.470	0.823
		Inconsequential	0.055	0.048	0.078	0.139	0.068	0.031	0.016	0.012	0.012	0.021	0.029	0.065
4	Susquehanna	Class 1	1.053	0.913	1.620	1.998	0.897	0.454	0.402	0.368	0.242	0.666	0.780	1.259
		Class 2	0.939	0.844	1.490	1.851	0.812	0.417	0.316	0.205	0.193	0.340	0.636	1.151
		Class 3	0.835	0.779	1.372	1.702	0.734	0.387	0.282	0.178	0.169	0.290	0.536	1.025
		Class 4	0.749	0.728	1.258	1.547	0.670	0.353	0.228	0.144	0.135	0.230	0.447	0.911
		Class 5	0.638	0.672	1.121	1.358	0.598	0.317	0.197	0.132	0.122	0.198	0.282	0.732
		Inconsequential	0.047	0.060	0.079	0.118	0.051	0.023	0.015	0.010	0.010	0.014	0.019	0.048
5	Western NY	Class 1	0.741	0.747	1.468	1.641	0.725	0.352	0.346	0.249	0.257	0.491	0.548	1.091
		Class 2	0.660	0.701	1.338	1.479	0.662	0.323	0.258	0.187	0.178	0.358	0.435	0.975
		Class 3	0.590	0.612	1.191	1.328	0.603	0.284	0.229	0.170	0.156	0.319	0.361	0.859
		Class 4	0.516	0.543	1.048	1.181	0.539	0.248	0.181	0.130	0.124	0.233	0.305	0.708
		Class 5	0.456	0.490	0.935	1.041	0.475	0.217	0.162	0.113	0.107	0.192	0.247	0.595
		Inconsequential	0.039	0.043	0.074	0.089	0.042	0.018	0.012	0.009	0.008	0.012	0.018	0.044

* See TOGS 1.3.12 for the description of monthly exceedance values used for calculating flow coefficients for each class. Inconsequential flows are less than 10 percent of the monthly P95 flow.

Appendix A

Monthly Exceedance Values Calculated for Reference Gages within Unaltered Waterways

Region1 – Adirondacks

USGS 04271815 LITTLE CHAZY RIVER NEAR CHAZY NY											DA= 50 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	10	12	21	47	22	7.9	3.7	1.9	1.4	5.5	8.6	13
P85	12	14	23	55	26	10	4.5	2.1	2.3	6.5	12	16
P80	14	16	25	66	28	13	5.4	2.9	2.6	8.0	18	21
P75	16	18	28	78	32	15	3.5	3.9	3.0	9.0	22	24
P70	18	20	30	89	35	17	7.6	4.9	3.4	10	26	27
P65	21	22	36	100	40	20	9.5	5.8	4.0	11	30	30
P50	31	26	52	132	54	30	15	8.2	5.6	13	43	38
Inconsequential flow (cfs)	0.93	0.98	1.40	3.80	1.70	0.53	0.28	0.15	0.12	0.35	0.68	0.97

USGS 04276842 PUTNAM CREEK EAST OF CROWN POINT CENTER NY											DA= 52 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	19	20	26	67	27	8.6	3.1	1.8	2.3	6.7	18	24
P85	22	22	30	78	33	11	4.4	3.0	3.3	8.5	21	29
P80	26	23	35	89	38	13	5.7	3.7	4.1	10	26	33
P75	29	25	41	102	43	16	7.0	4.6	5.2	12	30	37
P70	32	27	47	114	48	18	8.2	5.5	6.2	13	33	40
P65	37	29	55	129	54	22	9.9	7.1	6.9	15	39	44
P50	50	35	80	174	72	32	15	12	9.1	22	55	57
Inconsequential flow (cfs)	1.70	1.90	2.20	5.30	2.10	0.51	0.22	0.12	0.12	0.57	1.29	2.10

USGS 01349150 CANAJOHARIE CREEK NR CANAJOHARIE NY											DA= 60 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	11	18	35	33	12	4.7	2.7	1.5	1.6	2.1	4.2	10
P85	13	20	41	37	14	5.5	3.1	1.8	1.9	2.9	4.8	19
P80	18	23	47	43	16	6.3	3.4	2.1	2.2	4.1	6.0	24
P75	23	26	56	49	18	7.4	3.9	2.5	2.6	4.6	11	27
P70	27	28	64	55	20	8.5	4.4	2.9	2.9	5.1	16	30
P65	32	32	78	66	24	10	5.1	3.5	3.5	6.3	21	35
P50	46	44	118	98	34	15	7.1	5.3	5.1	10	36	50
Inconsequential flow (cfs)	0.61	1.50	1.80	2.70	1.00	0.37	0.24	0.12	0.14	0.13	0.19	0.43

USGS 04273700 SALMON RIVER AT SOUTH PLATTSBURGH NY										DA= 63 mi²		
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	22	22	27	55	34	17	13	12	12	18	22	28
P85	24	23	32	61	39	21	15	13	13	19	25	32
P80	26	25	38	67	42	24	17	14	14	20	29	34
P75	30	27	43	77	45	27	18	16	15	21	32	37
P70	33	28	47	87	47	30	19	17	16	22	34	39
P65	37	30	51	98	50	33	21	18	17	24	37	41
P50	50	37	64	129	60	41	26	21	19	28	45	47
Inconsequential flow (cfs)	2.00	1.80	2.40	4.10	2.80	1.40	1.10	1.10	1.10	1.60	2.00	2.40

USGS 04273800 LITTLE AUSABLE RIVER NEAR VALCOUR, NY										DA= 68 mi²		
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	17	16	20	47	28	11	7.1	5.9	5.6	11	20	19
P85	20	17	25	52	33	15	8.4	7.0	6.4	12	24	24
P80	22	19	28	57	35	17	10	8.0	7.4	13	26	27
P75	24	20	32	64	38	21	11	9	8.2	14	28	29
P70	26	21	36	71	41	24	12	10	9	15	29	31
P65	29	22	41	80	44	27	14	11	9.5	17	32	33
P50	37	26	56	105	54	36	21	14	11	21	40	39
Inconsequential flow (cfs)	1.50	1.40	1.59	3.80	2.30	0.79	0.61	0.49	0.50	0.85	1.50	1.80

USGS 042560000 INDEPENDENCE RIVER AT DONNATTSBURG, NY										DA= 89 mi²		
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	71	64	80	163	95	53	39	26	24	46	88	107
P85	80	69	88	178	102	60	42	28	30	56	103	113
P80	88	74	96	196	110	66	46	30	34	67	118	120
P75	94	79	103	212	119	72	50	32	37	78	129	130
P70	100	84	110	227	127	78	53	34	40	88	140	140
P65	107	90	125	249	137	87	58	39	45	101	154	151
P50	129	106	171	316	165	113	72	53	60	139	195	183
Inconsequential flow (cfs)	6.19	6.00	7.40	13.59	8.30	4.39	3.59	2.20	2.00	3.59	5.49	9.39

USGS 04270200 LITTLE SALMON RIVER AT BOMBAY NY											DA= 92 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	54	46	46	119	63	33	27	21	19	30	55	58
P85	60	50	54	133	68	37	29	23	21	32	60	65
P80	64	54	62	148	72	43	32	25	22	34	70	70
P75	69	56	71	160	76	46	34	26	24	37	77	75
P70	74	58	80	171	80	48	35	27	25	39	83	80
P65	78	61	90	188	85	53	37	29	27	44	91	85
P50	88	71	120	237	100	66	42	35	32	59	114	100
Inconsequential flow (cfs)	4.70	4.23	4.10	10.32	5.90	3.00	2.40	1.90	1.70	2.70	5.00	5.00

USGS 04250750 SANDY CREEK NEAR ADAMS NY											DA= 137 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	84	100	140	216	68	30	14	6.9	4.5	27	83	148
P85	97	107	150	250	80	33	16	8.8	7.3	34	101	160
P80	120	110	160	284	88	37	18	10	9.3	45	130	180
P75	140	118	176	316	97	41	21	13	11	57	157	195
P70	160	125	192	348	105	45	23	15	13	68	183	210
P65	175	139	223	377	118	53	26	18	17	86	212	233
P50	220	180	317	462	158	75	35	25	28	138	297	300
Inconsequential flow (cfs)	8.00	9.00	11.00	17.99	6.10	2.50	1.20	0.58	0.38	2.10	6.90	12.00

USGS 04280450 METTAWEE RIVER NEAR MIDDLE GRANVILLE NY											DA= 167 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	110	100	145	235	116	61	29	18	16	28	56	101
P85	120	110	166	265	131	70	34	21	20	33	71	137
P80	149	120	190	292	149	80	38	24	24	40	79	164
P75	170	127	220	324	168	89	44	28	29	47	100	179
P70	190	134	250	355	186	98	49	31	34	53	120	193
P65	204	148	281	384	205	109	57	39	37	59	140	213
P50	247	190	374	471	260	142	80	63	47	76	200	271
Inconsequential flow (cfs)	6.80	9.00	11.34	20.99	10.09	4.70	2.30	1.59	1.30	2.40	3.90	8.02

USGS 04268800 WEST BRANCH ST. REGIS RIVER NEAR PARISHVILLE, NY											DA= 171 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	60	64	88	153	94	48	26	19	19	37	54	77
P85	64	71	98	164	101	56	32	21	21	41	64	88
P80	71	78	109	175	110	62	37	22	23	49	85	99
P75	82	83	120	186	119	69	43	25	27	59	103	109
P70	93	88	130	196	128	75	49	28	30	68	121	118
P65	102	94	145	212	140	84	53	33	38	81	132	127
P50	130	110	190	259	175	109	66	48	61	120	166	152
Inconsequential flow (cfs)	5.49	5.60	7.80	14.10	8.40	4.10	2.10	1.79	1.60	3.30	3.20	6.79

USGS 04280000 POULTNEY RIVER BELOW FAIR HAVEN, VT											DA= 187 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	100	125	150	209	93	41	18	10	7.9	18	57	93
P85	116	130	166	237	106	49	22	12	10	27	65	111
P80	136	140	182	269	120	55	25	14	13	36	80	131
P75	150	146	202	296	136	62	30	18	18	41	103	151
P70	163	152	221	323	151	69	35	21	23	46	125	170
P65	176	163	255	359	167	79	42	29	27	53	145	193
P50	215	193	356	465	213	110	63	52	38	73	206	260
Inconsequential flow (cfs)	6.70	10.62	12.39	17.70	7.39	3.10	1.20	0.78	0.73	1.30	3.70	7.68

USGS 04262500 W. BRANCH OSWEGATCHIE RIVER NEAR HARRISVILLE, NY											DA= 258 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	215	202	252	487	248	126	93	65	61	154	259	284
P85	236	220	285	563	274	145	102	70	68	169	290	308
P80	253	230	314	626	303	161	113	76	79	190	320	333
P75	284	244	348	691	337	181	123	83	91	211	346	357
P70	314	258	382	756	370	200	132	90	102	232	372	380
P65	346	281	436	833	402	224	145	101	112	261	406	409
P50	442	350	599	1065	496	296	185	133	140	346	508	496
Inconsequential flow (cfs)	19.00	19.00	21.00	38.80	22.60	9.80	7.80	6.00	5.10	13.29	21.89	26.00

USGS 04276500 BOUQUET RIVER AT WILLSBORO NY											DA= 270 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	110	110	140	347	209	103	57	42	45	72	117	130
P85	122	120	150	395	237	116	67	47	53	78	129	150
P80	140	130	170	461	261	128	72	53	64	88	145	160
P75	155	135	200	506	293	143	80	60	70	96	158	170
P70	170	140	229	550	324	158	88	66	75	103	171	180
P65	190	150	254	598	352	177	97	75	80	114	192	198
P50	250	180	330	742	435	235	125	103	94	148	256	250
Inconsequential flow (cfs)	10.0	9.8	11.0	24.6	18.6	7.3	4.9	3.7	3.9	5.6	9.8	11.4

USGS 01329490 BATTEN KILL BELOW MILL AT BATTENVILLE NY											DA= 396 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	310	330	451	783	415	245	201	111	94	137	228	349
P85	380	351	493	857	463	276	218	121	108	155	271	424
P80	420	391	528	907	501	318	233	134	125	199	306	500
P75	460	418	589	969	547	347	248	149	139	225	364	535
P70	500	444	650	1030	593	376	262	164	153	250	421	569
P65	558	484	731	1131	631	416	283	183	171	271	485	617
P50	730	605	973	1435	744	537	344	240	225	334	675	760
Inconsequential flow (cfs)	26.40	28.00	37.00	65.28	35.59	20.40	17.81	10.00	8.60	11.86	18.90	29.67

USGS 04275500 AUSABLE RIVER NEAR AU SABLE FORKS NY											DA= 446 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	221	210	250	664	531	235	160	134	129	200	315	280
P85	240	220	270	778	567	263	182	145	143	218	350	310
P80	262	236	300	887	624	300	195	153	157	233	387	330
P75	286	253	322	979	689	338	213	167	171	249	417	354
P70	310	269	344	1070	754	375	230	180	184	265	447	378
P65	340	284	383	1188	833	416	253	197	194	298	477	403
P50	429	330	497	1540	1070	538	322	248	222	397	568	476
Inconsequential flow (cfs)	20.00	20.00	23.00	50.99	46.32	19.58	14.29	11.90	11.50	18.00	27.30	24.00

USGS 01321000 SACANDAGA RIVER NEAR HOPE NY											DA= 491 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	420	370	430	1287	500	170	84	53	56	155	352	460
P85	450	390	470	1470	577	211	102	59	70	204	429	515
P80	500	420	507	1678	651	236	122	67	95	231	499	560
P75	530	450	593	1859	736	271	137	84	120	270	587	600
P70	560	480	679	2040	821	305	151	100	144	309	675	640
P65	595	510	784	2245	916	361	177	128	162	355	754	702
P50	700	600	1100	2860	1200	529	254	210	214	491	992	886
Inconsequential flow (cfs)	40.00	34.00	39.00	102.85	40.87	11.78	7.00	4.60	4.50	11.20	22.80	41.96

USGS 01334500 HOOSIC RIVER NEAR EAGLE BRIDGE, NY											DA= 510 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	393	370	580	908	483	277	166	133	122	177	311	430
P85	470	430	649	981	540	310	189	146	131	210	400	499
P80	508	471	756	1088	607	340	209	155	144	247	470	560
P75	554	510	820	1174	665	365	231	166	154	287	524	620
P70	600	548	884	1260	722	390	252	177	164	327	577	680
P65	654	596	968	1370	787	427	276	196	188	365	639	748
P50	817	740	1220	1700	982	536	346	253	261	479	824	953
Inconsequential flow (cfs)	33.95	31.20	46.00	81.79	42.78	22.59	14.70	11.59	11.00	14.69	22.40	38.00

USGS 04273500 SARANAC RIVER AT PLATTSBURGH NY											DA= 608 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	500	460	530	1039	608	344	310	283	272	395	479	540
P85	540	490	572	1270	709	393	350	307	305	417	543	568
P80	564	520	601	1390	785	483	378	336	327	444	617	600
P75	592	540	641	1495	908	553	415	354	343	470	663	634
P70	620	560	680	1600	1030	622	451	371	359	496	708	668
P65	670	590	741	1703	1108	680	485	401	378	536	751	709
P50	821	680	923	2010	1340	853	587	491	436	656	880	831
Inconsequential flow (cfs)	45.00	41.00	46.95	84.47	52.10	30.67	26.00	25.48	24.80	35.19	42.80	47.00

USGS 04269000 ST. REGIS RIVER AT BRASHER CENTER NY											DA= 612 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	430	479	520	1200	640	330	272	214	214	374	601	520
P85	460	500	580	1290	696	373	299	239	256	405	663	560
P80	500	520	640	1410	749	420	340	265	272	438	711	600
P75	557	550	690	1554	810	488	373	293	288	477	766	650
P70	613	580	740	1697	871	556	405	321	304	516	821	700
P65	672	615	830	1883	951	616	438	346	330	587	885	765
P50	850	720	1100	2440	1190	795	536	420	407	800	1075	958
Inconsequential flow (cfs)	37.00	42.10	49.58	96.00	56.98	25.14	21.12	19.00	17.85	33.84	51.05	48.00

Region 2 – Lower Hudson

USGS 01362497 LITTLE BEAVER KILL @ BEECHFORD NR MT TREMPER NY											DA= 16.5 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	10	9	15	15	8.0	4.0	1.5	0.6	0.8	1.6	4.5	8.8
P85	12	10	22	18	9	5.2	1.9	0.9	1.2	2.7	9	14
P80	13	10	24	20	11	6.2	2.3	1.3	1.4	3.3	14	16
P75	16	12	26	23	13	7.7	2.8	1.7	1.7	4.6	16	19
P70	18	14	28	25	15	9.2	3.3	2.0	1.9	5.9	17	21
P65	21	16	31	28	17	11	3.8	2.4	2.7	7.9	20	24
P50	31	22	41	38	23	16	5.4	3.6	5.0	14	28	33
Inconsequential flow (cfs)	0.74	0.75	0.89	1.20	0.64	0.30	0.11	0.04	0.05	0.13	0.20	0.67

USGS 01374890 CROSS RIVER NEAR CROSS RIVER NY											DA= 17.1 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	11	11	20	18	11	4.2	1.4	0.6	0.9	1.8	3.3	6.0
P85	15	14	25	21	13	5.1	1.8	0.8	1.2	2.3	4.9	8.9
P80	18	17	28	25	15	6.1	2.1	1.1	1.4	2.9	7.1	14
P75	20	21	30	28	17	7.2	2.5	1.4	1.7	3.6	9.6	16
P70	22	25	32	30	18	8.2	2.8	1.7	1.9	4.3	12	18
P65	26	27	34	33	20	9.7	3.5	2.2	2.4	5.7	15	22
P50	37	34	41	40	25	14	5.6	3.7	3.8	10	24	34
Inconsequential flow (cfs)	0.54	0.90	1.67	1.40	0.79	0.29	0.11	0.04	0.05	0.14	0.16	0.45

USGS 01365500 CHESTNUT CREEK AT GRAHAMSVILLE NY											DA= 20.9 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	13	14	20	27	17	10	6.7	4.6	4.3	5.2	12	18
P85	14	15	21	30	19	11	7.3	5.1	4.6	6.8	16	23
P80	17	17	23	32	20	12	8.2	5.4	5.1	7.6	19	26
P75	19	18	27	34	22	13	9.1	6.0	5.8	9.8	22	29
P70	21	18	30	36	24	14	10	6.6	6.4	12	24	31
P65	24	20	34	39	26	17	11	7.5	8.1	15	27	33
P50	32	25	46	47	32	25	14	10	13	25	35	40
Inconsequential flow (cfs)	0.79	1.10	1.80	2.40	1.40	0.78	0.59	0.41	0.40	0.47	0.43	1.10

USGS 01362370 STONY COVE CREEK BLW OX CLOVE AT CHICHESTER, NY											DA= 30.9 mi	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	22	13	28	61	34	19	8.9	5.5	5.7	11	16	33
P85	27	17	36	69	40	21	10	6.2	6.2	12	22	38
P80	30	19	40	77	44	23	11	6.6	7.3	13	28	41
P75	34	23	45	84	48	27	13	7.5	9.2	15	35	45
P70	38	26	50	91	52	30	14	8.4	11	16	42	48
P65	43	30	61	98	57	35	17	10	13	21	49	53
P50	57	40	93	120	71	48	24	15	18	35	70	67
Inconsequential flow (cfs)	1.60	1.20	2.20	5.05	2.91	1.60	0.78	0.51	0.50	1.00	0.84	2.32

USGS 01365000 RONDOUT CREEK NEAR LOWES CORNERS, NY											DA= 38.3 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	35	33	45	77	47	24	11	8.2	8.7	12	24	50
P85	40	36	56	84	52	28	14	10	10	16	31	59
P80	45	40	70	90	58	30	16	11	11	21	49	65
P75	50	43	78	96	62	33	20	13	13	25	58	71
P70	54	45	86	102	66	35	23	14	14	29	66	76
P65	61	49	94	110	72	40	26	17	17	33	72	81
P50	82	62	117	133	90	53	34	27	27	45	89	97
Inconsequential flow (cfs)	3.10	2.90	3.40	6.70	4.20	1.90	0.96	0.74	0.73	1.00	2.00	3.29

USGS 0137449480 E. BRANCH CROTON RIVER NEAR PUTNAM LAKE NY											DA= 62.1 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	36	31	72	72	32	11	4.4	1.6	2.5	9.3	14	25
P85	40	39	88	82	39	14	6.4	2.5	3.2	11	22	34
P80	45	47	100	91	46	18	8.2	4.2	4.1	13	30	47
P75	53	62	110	101	55	23	11	5.5	6.8	17	44	59
P70	60	76	120	111	63	27	14	6.8	9.4	20	58	70
P65	73											
P50	110	112	159	147	91	50	26	15	18	40	100	117
Inconsequential flow (cfs)	1.50	2.40	4.80	6.20	2.37	0.70	0.25	0.05	0.14	0.51	0.60	1.80

USGS 01362200 ESOPUS CREEK AT ALLABEN NY											DA= 63.7 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	50	42	61	120	63	29	13	8.0	8.5	15	32	61
P85	58	46	69	134	69	35	15	10	10	16	40	70
P80	64	51	82	148	77	39	17	11	11	19	53	80
P75	70	56	99	159	85	44	20	13	13	25	65	91
P70	76	60	115	170	93	48	23	15	15	30	77	101
P65	85	67	130	186	103	54	27	18	18	36	91	110
P50	110	88	173	233	131	70	39	26	26	54	132	137
Inconsequential flow (cfs)	4.10	3.30	4.90	10.69	5.50	2.30	1.10	0.68	0.69	1.30	1.50	4.70

USGS 01372500 WAPPINGER CREEK NEAR WAPPINGER FALLS, NY											DA= 181 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	117	110	160	179	110	46	21	10	8.6	15	44	66
P85	130	130	235	201	120	55	26	13	11	22	72	123
P80	150	145	269	222	133	61	29	15	13	29	89	158
P75	165	163	290	247	148	69	33	18	16	36	101	184
P70	180	180	311	272	162	76	37	21	18	43	113	210
P65	204	203	334	296	179	86	44	28	25	56	125	233
P50	276	271	404	369	229	114	63	47	46	95	159	300
Inconsequential flow (cfs)	5.50	6.84	11.70	15.20	9.40	3.60	1.30	0.74	0.62	1.30	2.50	3.40

USGS 01200000 TENMILE RIVER NEAR GAYLORDSVILLE, CT											DA= 203 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	149	142	196	245	150	67	32	22	19	29	57	82
P85	172	150	252	271	164	83	38	26	22	34	79	141
P80	190	162	290	296	177	92	47	30	26	42	99	185
P75	205	180	313	325	196	102	55	37	29	51	119	211
P70	220	197	335	354	215	112	63	43	32	60	139	237
P65	251	219	363	382	232	125	72	52	41	71	155	267
P50	344	286	446	467	281	163	100	77	68	103	201	356
Inconsequential flow (cfs)	8.06	12.86	15.69	21.02	13.16	5.49	2.40	1.80	1.60	2.29	3.60	6.50

Region 3 - Catskill

USGS 01434017 E. BRANCH NEVERSINK RIVER NEAR CLARYVILLE, NY											DA= 22.9 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	24	22	26	52	33	20	12	8.4	8.7	14	20	31
P85	27	23	30	56	36	23	14	9.3	10	16	27	35
P80	30	25	34	61	38	24	15	10	12	19	35	39
P75	33	27	38	67	41	26	18	12	14	22	40	42
P70	36	28	41	70	44	28	20	13	15	25	45	45
P65	40	30	46	76	47	31	22	15	18	29	50	48
P50	51	34	62	92	57	41	28	21	25	40	65	57
Inconsequential flow (cfs)	2.10	1.90	2.30	4.60	2.99	1.70	1.00	0.75	0.70	1.30	1.20	2.50

USGS 01414500 MILL BROOK NEAR DUNRAVEN NY											DA= 25.2 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	18	15	25	41	20	10	4.3	3.0	3.2	7.8	15	25
P85	20	17	29	46	23	12	5.8	3.5	3.5	9.5	22	28
P80	23	18	34	52	26	14	7.1	3.8	4.1	11	25	32
P75	27	21	39	56	29	16	8.1	4.4	5.0	13	29	35
P70	30	23	43	60	31	17	9.1	4.9	5.8	15	33	38
P65	34	26	49	65	35	20	11	6.2	6.9	18	38	42
P50	44	35	66	79	46	27	15	10	10	26	53	52
Inconsequential flow (cfs)	1.50	1.30	1.80	3.70	1.70	0.76	0.33	0.25	0.29	0.57	1.00	2.00

USGS 01349810 WEST KILL NEAR WEST KILL NY											DA= 27.0 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	16	11	24	49	24	11	5.6	2.6	2.5	6.8	13	22
P85	18	12	26	53	29	13	6.4	2.9	2.7	8.7	20	26
P80	21	14	28	56	33	15	7.4	3.2	3.0	11	26	28
P75	24	16	31	60	37	18	8.7	3.6	3.9	13	30	31
P70	27	18	34	64	40	21	10	4.0	4.7	15	33	34
P65	31	22	41	69	43	25	12	5.4	6.8	20	37	38
P50	43	32	62	85	51	37	16	9.4	13	35	50	48
Inconsequential flow (cfs)	1.30	0.91	1.90	4.20	2.00	0.94	0.44	0.19	0.21	0.58	0.77	1.74

USGS 01350080 MANOR KILL AT WEST CONESVILLE NR GILBOA NY											DA= 32.4 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	11	11	23	38	15	5.6	3.4	2.1	2.0	2.1	5.2	9
P85	15	13	28	44	18	6.4	3.8	2.4	2.2	2.6	7.2	18
P80	18	15	31	49	21	7.5	4.2	2.8	2.3	3.6	12	23
P75	20	17	34	54	24	8.8	4.6	3.2	2.5	4.5	17	26
P70	22	19	36	58	26	10	5.0	3.6	2.7	5.4	22	29
P65	25	22	41	64	30	12	5.5	4.0	3.3	6.6	26	32
P50	35	31	55	83	42	16	7.1	5.2	5.0	10	36	40
Inconsequential flow (cfs)	0.56	0.94	1.40	3.30	1.20	0.47	0.27	0.18	0.17	0.19	0.31	0.45

USGS 01415000 TREMPER KILL NEAR ANDES, NY											DA= 33.2 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	17	15	34	41	17	7.9	3.8	2.4	2.5	5.3	12	21
P85	22	19	38	46	21	9.0	4.9	2.7	3.2	7.5	20	26
P80	27	22	41	50	23	10	5.9	3.1	4.0	8.5	24	31
P75	30	24	45	54	27	12	6.9	3.8	4.7	10.8	28	35
P70	33	26	49	57	30	13	7.8	4.4	5.4	13	32	39
P65	38	30	55	63	33	16	9.1	5.8	6.3	17	37	44
P50	52	43	74	82	42	23	13	10	9.0	27	51	60
Inconsequential flow (cfs)	1.50	1.30	2.50	3.40	1.30	0.64	0.31	0.21	0.19	0.35	0.60	1.40

USGS 01434498 WEST BRANCH NEVERSINK R AT CLARYVILLE											DA= 33.8 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	35	35	42	79	46	29	15	10	10	20	32	46
P85	41	37	47	86	51	32	18	11	11	22	36	53
P80	46	40	53	92	54	34	19	12	12	26	46	59
P75	52	43	60	101	59	37	21	14	15	30	56	64
P70	58	45	66	109	63	39	23	15	17	33	66	68
P65	63	48	75	118	68	44	26	18	21	39	73	74
P50	76	55	101	143	83	57	36	25	32	55	95	90
Inconsequential flow (cfs)	3.00	3.10	3.80	6.80	4.10	2.50	1.20	0.90	0.87	1.80	1.80	4.00

USGS 01414000 PLATTE KILL AT DUNRAVEN NY										DA= 34.9 mi²		
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	23	16	39	43	24	10	5.0	3.3	3.2	3.7	7.1	25
P85	25	19	43	52	28	13	6.1	3.7	3.4	4.5	15	30
P80	29	22	45	57	30	15	7.0	3.9	3.7	7.1	26	36
P75	32	25	48	62	33	17	8.5	4.4	4.5	12	30	42
P70	35	27	50	67	36	19	10	4.8	5.2	16	34	47
P65	40	32	58	73	40	23	11	6.4	7.4	20	40	53
P50	56	46	80	91	53	36	15	11	14	32	56	69
Inconsequential flow (cfs)	2.00	1.40	2.83	3.85	2.00	0.87	0.41	0.28	0.27	0.31	0.48	1.27

USGS 01349700 EAST KILL NR JEWETT CENTER NY										DA= 35.6 mi²		
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	19	14	32	47	26	8.9	4.4	1.9	2.2	4.8	6.0	16
P85	22	17	36	52	29	11	5.3	2.3	2.6	5.7	11	22
P80	25	20	40	57	33	13	6.0	2.7	3.1	6.9	23	30
P75	28	23	44	62	37	15	6.7	3.1	3.8	9.5	28.5	35
P70	30	25	47	67	40	17	7.4	3.5	4.5	12	34	40
P65	33	29	52	74	43	21	8.3	4.2	5.7	17	40	43
P50	42	40	68	96	52	33	11	6.4	9.2	32	59	52
Inconsequential flow (cfs)	1.51	1.20	2.70	3.95	2.00	0.68	0.29	0.13	0.20	0.38	0.47	1.30

USGS 01413398 BUSH KILL NEAR ARKVILLE NY										DA= 46.7 mi²		
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	30	23	44	69	40	20	13	6.7	5.4	8.5	10	19
P85	34	27	48	75	43	24	14	7.8	5.9	9.3	18	32
P80	40	31	52	80	48	27	16	8.5	6.7	11	33	39
P75	44	35	59	88	52	32	18	9.8	8	15	40	46
P70	47	38	66	95	55	37	20	11	9.3	18	46	52
P65	54	42	74	103	62	44	23	13	12	26	53	58
P50	74	55	99	126	81	64	32	20	21	49	72	76
Inconsequential flow (cfs)	2.40	2.10	3.66	5.80	3.50	1.60	1.00	0.57	0.47	0.76	0.78	1.50

USGS 01435000 NEVERSINK RIVER NEAR CLARYVILLE, NY											DA= 66.6 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	65	65	82	148	91	48	28	19	19	36	56	89
P85	74	71	95	159	99	56	32	21	22	41	72	102
P80	87	76	105	170	108	62	38	24	26	49	96	113
P75	95	81	118	181	115	67	43	28	31	57	111	122
P70	102	86	131	192	121	72	47	31	35	64	125	130
P65	112	92	155	206	131	80	52	37	42	75	137	140
P50	142	109	190	249	162	103	65	53	62	109	173	169
Inconsequential flow (cfs)	5.90	6.10	7.20	13.20	8.20	4.10	2.20	1.80	1.70	3.20	3.30	7.30

USGS 01413408 DRY BROOK AT ARKVILLE, NY											DA= 82.2 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	58	45	87	136	73	38	19	11	11	17	25	57
P85	64	48	94	147	82	43	22	13	12	20	45	71
P80	70	52	100	160	90	52	27	15	13	25	64	86
P75	78	60	114	171	99	61	32	16	15	29	77	98
P70	86	67	127	182	108	69	36	17	17	33	89	110
P65	95	77	143	198	121	79	41	21	22	48	104	120
P50	120	108	189	245	158	109	57	32	38	94	149	151
Inconsequential flow (cfs)	4.82	3.80	7.40	11.65	6.50	3.00	1.51	1.00	0.93	1.30	2.10	3.91

USGS 01349705 SCHOHARIE CREEK NEAR LEXINGTON NY											DA= 96.8 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	52	41	89	144	74	40	19	10	12	25	32	80
P85	60	47	110	160	85	48	22	11	14	32	61	91
P80	66	52	125	172	101	55	24	14	18	39	75	102
P75	74	63	134	191	110	67	27	17	22	47	95	111
P70	82	73	142	209	119	78	30	19	26	54	114	120
P65	92	82	158	227	128	90	34	23	33	73	128	134
P50	120	110	207	280	155	126	44	36	52	128	171	174
Inconsequential flow (cfs)	4.80	3.60	6.85	12.59	5.79	3.40	1.70	0.86	0.99	2.10	2.15	5.80

USGS 01413500 EAST BR DELAWARE R AT MARGARETVILLE NY										DA= 163 mi²		
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	100	92	170	248	123	52	26	16	16	31	60	123
P85	118	100	190	274	139	62	31	19	18	36	96	154
P80	130	113	205	298	151	74	37	22	21	41	116	180
P75	155	127	228	326	170	85	44	26	25	52	141	200
P70	180	140	251	353	189	95	50	29	29	62	166	220
P65	198	158	283	383	210	108	58	35	34	73	195	245
P50	250	211	379	473	274	145	81	51	50	107	282	318
Inconsequential flow (cfs)	8.80	7.60	11.67	21.60	10.10	4.19	2.00	1.40	1.30	2.20	3.70	8.48

USGS 01350000 SCHOHARIE CREEK AT PRATTSVILLE, NY										DA= 237 mi²		
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	130	93	199	335	152	50	23	15	16	35	77	140
P85	154	102	250	367	179	64	27	18	19	45	106	171
P80	170	136	279	404	209	75	33	20	22	56	142	200
P75	195	158	310	445	236	87	41	25	27	66	177	236
P70	220	180	340	485	262	98	49	29	32	76	211	271
P65	240	208	383	542	290	117	56	35	39	97	254	303
P50	301	290	510	712	372	173	78	52	61	158	383	400
Inconsequential flow (cfs)	10.00	7.02	15.00	29.39	12.90	3.90	1.70	1.20	1.20	2.80	4.60	10.50

USGS 01420500 BEAVER KILL AT COOKS FALLS NY										DA= 241 mi²		
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	191	180	260	416	226	124	68	50	51	89	166	260
P85	212	200	290	457	246	140	82	53	58	110	225	297
P80	230	210	330	485	278	152	94	59	64	122	267	325
P75	259	230	381	521	306	167	107	64	74	137	307	358
P70	287	250	432	557	334	182	119	69	84	151	346	391
P65	316	269	488	611	367	203	133	85	98	180	386	424
P50	401	324	657	772	466	265	175	132	140	266	504	522
Inconsequential flow (cfs)	16.00	16.04	22.30	37.50	19.10	10.40	5.80	4.60	4.50	7.50	9.90	22.10

Region 4 – Susquehanna

USGS 0142400103 TROUT CREEK NEAR TROUT CREEK, NY											DA= 20.2 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	12	10	21	24	11	4.9	2.1	0.7	0.9	1.6	2.6	8.5
P85	13	10	23	28	13	6.1	2.6	0.8	1.1	1.9	5.3	11
P80	14	13	26	31	15	6.8	3.1	1.0	1.2	2.4	8.5	14
P75	16	15	28	35	17	7.8	3.5	1.2	1.4	3.6	12	19
P70	18	17	30	38	18	8.8	3.9	1.4	1.6	4.7	16	23
P65	22	20	35	41	20	11	4.6	1.7	2.1	7.8	19	26
P50	32	30	50	50	25	17	6.6	2.7	3.5	17	26	36
Inconsequential flow (cfs)	0.68	0.85	1.90	1.95	0.81	0.31	0.17	0.06	0.06	0.12	0.13	0.41

USGS 01422747 EAST BROOK, EAST OF WALTON, NY											DA= 24.7 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	13	10	24	30	16	5.8	4.1	1.9	1.9	3.6	11	20
P85	15	14	26	34	18	6.7	4.6	2.2	2.1	4.2	19	27
P80	18	16	29	37	19	7.6	5.1	2.6	2.8	5.7	21	32
P75	20	21	32	40	20	8.8	5.5	3.2	3.5	9.4	24	35
P70	21	25	34	43	21	10	5.8	3.8	4.1	13	26	38
P65	25	28	39	47	22	14	7.1	4.9	5.6	16	29	41
P50	36	35	53	57	26	25	11	8.0	10	25	39	50
Inconsequential flow (cfs)	1.10	0.97	2.30	2.70	1.20	0.48	0.35	0.16	0.16	0.28	0.25	1.40

USGS 01422500 LITTLE DELAWARE RIVER NEAR DELHI NY											DA= 49.8 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	32	24	54	61	30	14	6.9	3.7	3.6	5.1	7.9	27
P85	37	30	58	73	35	17	8.3	4.3	4.1	6.2	19	35
P80	41	33	64	86	37	20	10	5.0	4.9	9.3	33	45
P75	48	39	72	93	40	23	12	6.0	5.7	16	39	54
P70	54	44	80	99	43	26	14	7.0	6.5	22	44	62
P65	61	52	90	106	48	31	16	8.8	9.4	30	52	69
P50	80	74	120	128	64	44	22	14	18	52	77	90
Inconsequential flow (cfs)	2.51	2.00	4.60	5.00	2.40	1.10	0.48	0.30	0.29	0.40	0.48	1.60

USGS 01421900 W. BR. DELAWARE RIVER UPSTREAM OF DELHI, NY										DA= 134 mi²		
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	60	72	92	142	89	45	23	19	19	38	58	73
P85	64	77	110	155	96	49	27	20	21	44	72	81
P80	72	82	126	164	102	57	31	22	23	51	85	90
P75	84	86	142	176	111	63	38	26	27	60	103	100
P70	96	89	158	187	120	69	44	29	31	68	121	110
P65	105	94	170	199	132	76	49	35	38	77	131	118
P50	133	110	206	236	168	97	64	51	59	103	161	143
Inconsequential flow (cfs)	5.60	6.40	7.20	13.00	8.11	3.70	2.00	1.70	1.60	3.20	5.25	6.34

01510000 OTSELIC RIVER AT CINCINNATUS, NY										DA= 147 mi²		
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	100	95	140	198	75	41	24	14	13	26	60	120
P85	110	100	165	224	86	48	27	17	15	29	87	138
P80	119	110	183	250	99	54	33	19	17	35	99	153
P75	133	120	211	275	111	60	37	21	19	41	115	171
P70	147	130	238	300	123	66	40	22	21	46	131	189
P65	163	148	271	328	163	74	46	25	26	55	159	210
P50	210	200	371	413	176	99	62	35	39	82	244	272
Inconsequential flow (cfs)	8.60	8.56	10.00	16.35	6.55	3.20	1.90	0.91	0.70	2.30	4.80	8.60

USGS 01509000 TIOGHNIOGA RIVER AT CORTLAND, NY										DA= 292 mi²		
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	196	223	350	460	193	110	75	58	53	70	127	255
P85	250	240	390	506	216	126	82	70	60	80	143	290
P80	272	255	430	544	232	143	90	75	67	88	183	319
P75	316	273	468	594	254	158	101	79	72	97	210	352
P70	360	290	506	644	276	172	111	83	76	105	237	385
P65	390	327	558	698	302	190	123	90	82	122	277	421
P50	480	437	715	861	378	243	160	110	101	174	396	527
Inconsequential flow (cfs)	18.00	20.66	29.90	40.30	16.10	8.69	6.70	4.70	4.60	6.10	8.59	19.42

USGS 01423000 WEST BRANCH DELAWARE RIVER AT WALTON NY											DA= 332 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	180	190	354	454	206	99	48	31	27	38	104	212
P85	220	210	394	511	227	110	55	33	31	50	141	257
P80	270	240	420	547	250	123	64	36	35	65	202	320
P75	305	263	457	592	279	138	76	41	40	81	244	370
P70	340	285	494	636	308	152	87	46	45	97	285	420
P65	380	331	567	690	338	171	102	58	54	131	348	475
P50	500	470	780	852	428	229	146	95	80	234	536	639
Inconsequential flow (cfs)	15.00	16.08	26.95	39.67	17.40	8.40	3.90	2.70	2.40	3.10	4.30	10.13

USGS 01502500 UNADILLA RIVER AT ROCKDALE, NY											DA= 520 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	344	340	540	741	330	189	114	81	71	93	228	470
P85	418	370	600	843	367	202	129	86	80	110	312	550
P80	450	409	683	908	393	212	142	91	93	143	378	595
P75	506	449	743	1008	440	229	155	105	102	166	435	661
P70	561	488	802	1107	486	245	168	118	111	189	491	726
P65	611	546	894	1199	531	269	189	150	131	234	578	783
P50	760	720	1170	1475	666	339	252	247	192	369	839	954
Inconsequential flow (cfs)	26.92	31.60	32.36	65.90	29.27	16.50	9.30	7.30	6.40	7.92	9.84	33.50

01500500 SUSQUEHANNA RIVER AT UNADILLA, NY											DA= 982 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	602	665	1120	1499	680	371	188	130	109	175	299	776
P85	750	750	1240	1649	791	408	222	142	129	200	480	949
P80	830	850	1330	1790	848	437	277	153	150	239	629	1140
P75	990	941	1440	1975	917	470	307	176	177	270	807	1295
P70	1150	1032	1550	2160	986	502	337	199	203	300	985	1450
P65	1263	1147	1755	2390	1102	558	367	274	233	384	1114	1590
P50	1600	1490	2370	3080	1450	725	456	499	323	635	1500	2010
Inconsequential flow (cfs)	42.61	56.32	75.15	122.00	55.78	30.54	15.40	11.80	9.40	10.70	11.78	51.58

USGS 01512500 CHENANGO RIVER NEAR CHENANGO FORKS NY											DA= 1483 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	1000	1000	1709	1917	804	480	265	170	170	302	575	1295
P85	1129	1100	1900	2179	903	535	308	199	187	354	765	1500
P80	1296	1158	2134	2408	995	601	355	221	213	392	913	1700
P75	1423	1239	2322	2623	1123	657	403	259	237	429	1037	1840
P70	1550	1320	2510	2837	1250	713	450	296	261	465	1160	1980
P65	1713	1515	2813	3088	1384	792	510	331	304	557	1393	2141
P50	2200	2100	3720	3840	1785	1030	689	435	433	834	2090	2625
Inconsequential flow (cfs)	9.60	8.84	37.20	38.40	17.85	10.30	6.89	4.35	4.33	8.34	20.90	26.25

USGS 01503000 SUSQUEHANNA RIVER AT CONKLIN, NY											DA= 2232 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	1400	1500	2477	3008	1340	670	365	260	236	332	487	1450
P85	1649	1600	2800	3459	1489	750	408	282	260	395	890	1900
P80	1816	1700	3018	3818	1640	817	469	304	279	467	1040	2100
P75	2058	1850	3298	4129	1820	887	521	331	313	536	1329	2363
P70	2300	2000	3577	4440	2000	956	573	357	347	604	1617	2625
P65	2525	2275	3980	4800	2225	1076	671	444	402	744	1883	2871
P50	3200	3100	5190	5880	2900	1435	965	704	565	1165	2680	3610
Inconsequential flow (cfs)	86.70	135.0	170.0	265.0	113.0	47.90	32.70	22.50	20.90	29.00	36.19	81.00

Region 5 – Western NY

USGS 04233300 SIXMILE CREEK AT BETHEL GROVE, NY											DA= 39 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	20	25	39	40	19	11	6.7	4.7	4.5	8.1	12	24
P85	23	29	47	45	21	13	8.9	5.5	5.2	8.8	15	30
P80	25	32	50	49	23	15	10	6.1	6.1	10	18	34
P75	28	34	54	52	25	18	11	6.9	6.9	11	20	37
P70	31	36	58	55	27	20	12	7.6	7.7	12	22	39
P65	35	40	64	59	30	23	13	8.2	8.3	13	26	43
P50	48	52	83	72	37	30	17	10	10	17	39	53
Inconsequential flow (cfs)	1.90	2.00	3.40	3.50	1.60	0.75	0.46	0.29	0.37	0.76	1.10	1.70

USGS 01518862 COWANESQUE RIVER AT WESTFIELD, PA											DA= 91 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	18	26	56	63	23	7.3	3.3	1.7	2.5	4.9	6.8	24
P85	23	31	65	72	27	9.1	4.2	2.4	2.8	5.6	8.5	33
P80	27	36	72	82	31	10	5.3	3.0	3.1	6.2	11	42
P75	36	43	82	93	34	12	6.2	3.6	3.7	7.6	17	49
P70	44	50	92	104	37	14	7.1	4.2	4.2	9.0	23	55
P65	53	56	104	120	41	17	8.6	5.0	5.4	11	32	62
P50	80	73	140	166	54	24	13	7.5	8.9	15	60	84
Inconsequential flow (cfs)	1.40	2.20	3.70	5.50	1.90	0.59	0.22	0.13	0.18	0.40	0.54	1.60

USGS 03021350 FRENCH CREEK NEAR WATTSBURG, PA											DA= 92 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	68	70	97	95	32	14	8.7	6.6	5.7	18	37	92
P85	77	80	112	105	38	17	10	7.6	6.6	21	56	111
P80	84	88	126	120	43	19	11	8.5	8.2	26	72	125
P75	93	94	143	132	48	22	13	9.8	11	31	83	134
P70	101	99	160	143	52	24	14	11	13	36	94	142
P65	112	114	183	161	59	27	17	14	16	43	113	156
P50	145	157	251	216	80	35	24	21	25	63	170	196
Inconsequential flow (cfs)	5.20	6.00	8.20	7.90	2.60	1.20	0.69	0.48	0.40	1.19	2.60	6.60

04215000 CAYUGA CREEK NEAR LANCASTER, NY											DA= 96.4 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	50	49	80	56	20	6.1	3.0	1.6	2.2	5.5	16	44
P85	54	54	87	67	22	8.1	3.9	2.1	2.9	7.3	21	55
P80	60	60	96	76	26	10	4.9	2.9	3.5	9.4	28	62
P75	64	65	112	88	30	12	5.9	3.8	4.5	12	36	71
P70	68	70	128	100	34	13	6.9	4.6	5.4	14.0	44	79
P65	77	80	142	110	39	16	7.9	5.5	6.3	17	55	92
P50	102	110	185	139	53	23	11	8.1	9.1	27	88	129
Inconsequential flow (cfs)	4.20	4.40	6.70	4.80	1.70	0.44	0.22	0.11	0.10	0.45	0.94	2.80

USGS 01525981 TUSCARORA CREEK ABOVE SOUTH ADDISON NY										DA= 102 mi²		
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	17	26	40	47	15	4.8	1.2	0.4	1.3	4.1	6.5	25
P85	25	30	50	54	18	6.2	1.8	0.6	1.6	4.8	8.5	35
P80	34	34	65	60	22	7.3	2.4	1.3	1.7	5.5	12	42
P75	43	37	75	68	25	8.7	3.1	1.8	2.2	7.3	18	49
P70	52	40	85	76	27	10	3.8	2.2	2.6	9.0	24	55
P65	61	48	95	90	31	12	4.8	3.1	4.5	11	31	64
P50	88	70	125	131	43	18	7.6	5.9	10	16	51	89
Inconsequential flow (cfs)	1.40	2.18	2.59	3.96	1.20	0.31	0.05	0.02	0.06	0.22	0.54	1.80

USGS 04234000 FALL CREEK NEAR ITHACA NY										DA= 126 mi²		
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	72	80	130	148	68	34	22	14	14	24	46	80
P85	80	88	141	165	74	41	26	17	17	28	57	89
P80	90	95	150	176	80	48	29	20	20	32	70	105
P75	98	101	167	190	87	53	33	23	22	37	82	116
P70	105	107	181	204	94	58	37	25	24	41	94	126
P65	119	118	202	221	103	65	41	28	27	48	107	139
P50	160	150	265	271	128	85	53	36	37	68	145	178
Inconsequential flow (cfs)	5.79	7.00	9.00	12.19	5.89	2.50	1.60	1.00	1.10	2.10	3.30	5.48

USGS 04215500 CAZENOVIA CREEK AT EBENEZER NY										DA= 135 mi²		
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	90	94	130	109	50	22	13	8.7	10	18	38	95
P85	98	99	150	125	54	25	16	10	11	23	51	110
P80	105	103	161	139	60	28	18	12	14	27	61	123
P75	117	112	183	153	66	62	21	14	16	32	76	137
P70	129	120	204	166	71	35	23	16	17	37	91	150
P65	144	138	228	185	79	39	26	19	20	43	108	165
P50	190	190	300	241	102	51	33	27	29	62	160	210
Inconsequential flow (cfs)	7.40	8.52	11.50	9.30	4.40	1.70	1.10	0.73	0.75	1.40	2.80	6.72

USGS 04214500 BUFFALO CREEK AT GARDENVILLE NY										DA= 142 mi²		
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	85	85	120	98	45	21	15	10	10	19	34	82
P85	92	92	136	113	50	25	16	11	12	23	42	99
P80	100	98	155	128	55	29	18	13	14	27	55	110
P75	105	108	173	143	61	32	20	15	16	31	66	125
P70	110	117	191	158	66	35	22	16	18	34	77	140
P65	125	130	213	173	73	39	24	18	21	40	93	155
P50	170	170	278	217	95	49	30	24	28	58	139	200
Inconsequential flow (cfs)	7.20	8.00	10.50	8.40	4.10	1.60	1.10	0.84	0.83	1.60	2.70	5.30

USGS 03007800 ALLEGHENY RIVER AT PORT ALLEGANY, PA										DA= 248 mi²		
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	100	109	211	299	132	56	34	22	20	27	47	171
P85	110	118	265	335	153	67	42	25	22	33	66	204
P80	130	130	296	364	175	76	47	29	25	39	92	228
P75	155	145	328	400	191	84	55	35	30	52	116	254
P70	180	160	360	436	207	92	62	40	34	65	140	279
P65	216	191	405	482	224	105	71	47	41	78	187	313
P50	322	282	540	620	276	143	97	66	62	118	328	414
Inconsequential flow (cfs)	9.10	9.64	16.00	26.29	11.10	4.50	2.60	1.70	1.50	2.30	3.60	11.88

USGS 04221000 GENESEE RIVER AT WELLSVILLE NY											DA= 288 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	104	126	220	273	117	49	30	20	20	34	49	121
P85	120	137	250	316	138	53	34	23	23	37	60	160
P80	135	150	290	345	155	62	39	25	26	40	70	181
P70	170	180	346	409	187	83	52	34	32	52	136	234
P50	290	270	485	584	257	131	82	52	56	90	274	356
Inconsequential flow (cfs)	8.90	11.00	16.00	23.55	9.95	4.10	2.60	1.80	1.70	2.90	3.40	7.20

USGS 04213500 CATTARAUGUS CREEK AT GOWANDA NY											DA= 436 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	340	300	530	531	268	155	127	93	88	113	211	400
P85	400	350	580	593	290	169	138	102	100	132	287	483
P80	440	400	624	665	311	185	151	114	113	151	328	550
P75	490	445	688	722	340	201	169	131	127	176	364	589
P70	540	490	752	778	369	217	187	147	141	200	399	628
P65	585	543	817	836	396	234	199	160	164	229	447	676
P50	720	700	1010	1010	475	285	234	200	233	317	590	821
Inconsequential flow (cfs)	29.00	27.00	47.40	45.89	25.10	13.90	11.79	8.40	8.10	9.80	16.45	33.40

USGS 01529500 COHOCTON RIVER NEAR CAMPBELL, NY											DA= 470 mi²	
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	120	200	320	413	169	88	51	38	29	49	73	130
P85	180	210	370	462	188	98	61	42	35	57	81	160
P80	200	240	408	506	207	110	73	47	44	65	90	200
P75	225	255	443	548	229	122	82	52	50	73	110	235
P70	250	270	478	589	250	133	91	56	56	80	129	269
P65	288	293	533	644	275	154	99	62	62	91	159	313
P50	400	360	698	810	349	215	124	81	78	124	249	443
Inconsequential flow (cfs)	9.50	18.00	27.49	33.10	14.40	6.70	4.50	3.30	2.60	4.00	4.60	9.24

USGS 03010500 ALLEGHENY RIVER AT ELDRED, PA											DA= 550 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	270	294	588	668	308	130	82	51	41	71	124	450
P85	301	330	667	749	366	148	96	64	51	83	160	527
P80	350	370	740	831	416	175	110	73	64	101	205	591
P75	425	410	822	906	454	194	123	86	73	126	280	646
P70	500	450	904	980	492	213	136	98	82	151	354	700
P65	575	520	987	1083	533	241	156	112	98	181	461	775
P50	800	730	1235	1390	656	325	214	152	145	272	783	1000
Inconsequential flow (cfs)	21.0	25.1	41.0	58.3	26.3	10.7	6.7	4.1	3.0	5.9	10.7	33.1

USGS 04223000 GENESEE RIVER AT PORTAGEVILLE NY											DA= 984 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	450	440	780	901	397	191	120	85	85	143	204	448
P85	503	500	900	1000	443	222	140	94	100	186	265	560
P80	566	550	1018	1110	485	252	159	110	120	240	320	689
P75	612	595	1138	1215	543	277	179	125	133	298	395	822
P70	657	640	1257	1320	600	301	199	140	146	355	470	954
P65	763	720	1378	1465	653	335	222	158	168	404	589	1047
P50	1080	960	1740	1900	810	438	290	210	232	552	945	1325
Inconsequential flow (cfs)	35.95	39.20	61.90	77.84	36.28	16.70	9.80	7.19	7.40	11.50	17.69	25.15

USGS 04227500 GENESEE RIVER NEAR MOUNT MORRIS, NY											DA= 1424 mi²	
percent exceedence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P90	510	700	1200	1280	562	269	173	126	111	225	292	615
P85	597	770	1369	1490	612	305	199	142	126	297	365	778
P80	696	839	1550	1740	661	334	221	157	147	364	426	1000
P75	778	909	1754	2084	727	372	250	177	172	417	507	1174
P70	860	978	1957	2427	793	409	278	196	197	470	587	1347
P65	1105	1146	2173	2834	882	456	307	214	226	519	729	1518
P50	1840	1650	2820	4055	1150	595	395	269	312	665	1155	2030
Inconsequential flow (cfs)	45.00	60.00	97.90	106.75	50.30	21.90	14.30	10.70	9.40	17.10	23.59	42.86

USGS 03011020 ALLEGHENY RIVER AT SALAMANCA NY										DA= 1608 mi²		
percent exceedence	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
P90	839	780	1700	1939	910	390	257	176	173	257	477	1250
P85	923	856	1866	2190	1060	450	289	201	196	308	570	1420
P80	1050	1000	2156	2430	1218	530	324	239	221	370	675	1700
P75	1200	1150	2392	2635	1339	604	371	284	246	444	886	1886
P70	1350	1300	2627	2840	1460	677	417	328	271	518	1097	2071
P65	1588	1500	2879	3124	1588	743	482	369	320	594	1373	2283
P50	2300	2100	3635	3975	1970	939	677	491	468	823	2200	2920
Inconsequential flow (cfs)	72.00	70.00	130.00	168.95	78.80	31.00	21.90	15.80	13.58	19.90	28.70	100.00

Attachment C

Passby Flow Examples

PASSBY FLOW EXAMPLES

(Hypothetical withdrawals)

UNGAGED SITE[1]		SITE INFORMATION	GAGED SITE[1]		
Catskill Creek		Source Name	Genesee River		
0.5 mgd / 0.8 cfs		Proposed Withdrawal	10 mgd / 15.5 cfs		
2		Hydrologic Region[2]	5		
NA		USGS Stream Gage[3]	Genesee River at Portageville		
NA		USGS Gage Number[3]	04223000		
NA		Gage Drainage Area[3]	984		
43 sqmi.		Site Drainage Area	800 sqmi.		
NA		Drainage Area Ratio[4]	0.81		
C(ts)		Stream Class[5]	C		
1*		Passby Flow Class[6]	4		
Inconsequential Withdrawal[7]	Passby Flow[7]	Month (all amounts in cfs)	Inconsequential Withdrawal[9]	Gaged Passby Flow[10]	Site Passby Flow[11]
1.6	NA	January	29	NA	NA
2.2	NA	February	32	NA	NA
3.1	NA	March[8]	50	NA	NA
4.3	NA	April[8]	63	NA	NA
2.6	NA	May[8]	29	NA	NA
1.1	NA	June	14	222	**180**
0.4	**19**	July	8	159	**129**
0.3	**14**	August	6	110	**89**
0.3	**15**	September	6	120	**97**
0.5	**23**	October	9	240	**194**
0.7	**31**	November	14	265	**215**
1.3	NA	December	20	NA	NA

1. See Section C.3.a.1 of the TOGS and Table 1 of Technical Methods.
2. See Figure 1 of TOGS.
3. See Table 1 of Technical Methods.
4. Site Drainage Area divided by Gage Drainage Area.
5. See Department's Environmental Resources Mapper.
6. See Section C.3.a of TOGS (*note that all t and ts streams are class 1).
7. See Table 2 of TOGS. Multiply monthly coefficients times site drainage area. If the proposed withdrawal is more than the inconsequential flow, a passby flow is required.
8. Action Level months. See Section E of TOGS.
9. See Appendix A of Technical Methods. Multiply each monthly inconsequential flow times Drainage Area Ratio. If the proposed withdrawal is more than the inconsequential flow, a passby flow is required.
10. See Table 1 of TOGS to determine appropriate P values for Passby Flow Class. Find gage table in Appendix A of Technical Methods and determine monthly passby flows for gaged location.
11. Multiply monthly Gaged Passby Flow times Drainage Area Ratio.