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The New York State
Consolidated Assessment and Listing Methodology

Section 305(b) Assessment Methodology

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Introduction

The Federal Clean Water Act requires states to periodically assess and report on the quality of waters in their state. Water quality reporting under Section 305(b) and Section 303(d) of the Act are highly visible ways of communicating to the public about the health of the nation's waters. Under Section 305(b), states are required to report on the quality of *all* waters in the state and whether these waters are fully supporting of appropriate uses, such as recreation, water supply use, aquatic life and other uses. Section 303(d) of the Act requires states to identify waters where water quality standards are not met and where uses are not supported. The Section 303(d) List of Impaired/TMDL¹ Waters includes those waters (and associated pollutants) that do not support uses, and which require development of a Total Maximum Daily Load (TMDL) strategy. Because the Section 303(d) List of Impaired/TMDL Waters is concerned with only impaired waters – and within the universe of impaired waters, only those impaired waters that can be addressed with a TMDL strategy – the Section 305(b) Report provides a more comprehensive assessment of statewide water quality.

In New York State the water quality assessment information used to compile the Section 305(b) Report and Section 303(d) List is maintained in a database known as the Waterbody Inventory/Priority Waterbodies List (WI/PWL). The WI/PWL is a statewide inventory of all New York State waterbodies which includes evaluations of the degree to which specific water uses in a waterbody are supported (*use support*) and the most current overall assessment of the water quality (*waterbody assessment*). The WI/PWL database also includes information concerning progress toward the identification of water quality problems and sources as well as discussion of activities to restore and protect each individual waterbody. The review and update of the WI/PWL information is a continuous process. Although waterbody information can be updated at any time, for the most part the update effort focuses attention on up to three of the major drainage basins in New York State each year. This rotating basin strategy aligns with the rotating cycle used by the New York State Department of Environmental Conservation (NYSDEC) statewide ambient water quality monitoring effort and results in the review and update of the WI/PWL for all waters in the state over a five year cycle.

This *Assessment Methodology* outlines how monitoring data and information is used by the NYSDEC to determine the level of use support in specific waterbodies and to arrive at an overall waterbody assessment of water quality. The assessment process begins by determining the level of support of specific designated uses in a waterbody using a wide range of available information evaluated against specific assessment criteria. If a specific use is restricted, then the degree to which it is restricted is evaluated and determined to be *Precluded*, *Impaired*, *Stressed*, *Threatened*, or *Fully Supported* (if the use is not restricted), or *Unassessed*. Each use evaluation also considers the level of confidence (*Known*, *Suspected*, or *Unconfirmed*) associated with the evaluation of use support. Finally, based on both the level of use support and the confidence in the evaluation of use support, all waterbodies are assigned to one of six *Waterbody Assessment Categories*:

- *Impaired Waters*,
- *Waters with Minor Impacts*,
- *Threatened Waters*,
- *Waters with Impacts that Need Verification*,
- *Waters Having No Known Impacts*, or
- *UnAssessed Waters*.

¹ Total Maximum Daily Load.

This methodology describes these terms in greater detail and outlines criteria that relate water quality monitoring data and information to the evaluation of use support for specific uses, and an overall assessment of water quality in a waterbody. Such criteria and the understanding of terminology are critical to providing a clear and consistent basis for an assessment of the quality of waters throughout New York State that is consistent with the Clean Water Act and governing regulation.

Waterbody Inventory/Priority Waterbodies List

As noted previously, NYSDEC maintains information regarding use support and waterbody assessments in its *Waterbody Inventory/Priority Waterbodies List (WI/PWL)* database. The *Waterbody Inventory* refers to the listing of all waters in the state, identified as specific waterbody segments, or *assessment units* (see *Segmentation of Waterbodies* below). The Waterbody Inventory includes both assessed and currently unassessed waters. The *Priority Waterbodies List* is the subset of waters in the Waterbody Inventory that have documented water quality impairments, lesser minor impacts, and/or threats to designated uses. The WI/PWL assessments provide the foundation for both the compilation of the biennial Section 305(b) Water Quality Report on all waters of the state, and the development of the state Section 303(d) List. More detail regarding the WI/PWL assessments can be found on the NYSDEC website at <http://www.dec.ny.gov/chemical/23846.html>.

The water quality assessment information in the WI/PWL is instrumental in directing other water quality management efforts. It is used to prioritize monitoring, permitting and compliance activities, to provide a comprehensive inventory of water quality conditions suitable for establishing funding priorities, to enlist participation of other agencies and local partners, and to track progress toward improving the state's water resources. The methodology outlined here goes beyond Section 305(b)/303(d) Integrated Reporting and reflects the use of the WI/PWL in supporting these additional needs. The methodology specific to developing the Section 303(d) List of Impaired/TMDL waters is discussed in more detail in the [Section 303\(d\) Listing Methodology](#) (separate document).

The water quality assessment information in the WI/PWL is also instrumental in directing other water quality management efforts. The methodology outlined here goes beyond Section 305(b)/303(d) integrated reporting and reflects the use of the WI/PWL in supporting these additional needs.

Updating the WI/PWL

The review and updating of the WI/PWL follows a continuing rotating basin schedule in which a portion of the state (typically, up to three of the drainage areas in the state) is scheduled for reassessment each year. This rotating basin schedule better accommodates a thorough evaluation that includes the opportunity for public participation and also addresses the challenge of conducting assessments for the large number of waterbodies in the state. These basin reassessments typically follow the same five year rotation schedule employed by the NYSDEC Statewide Water Monitoring Program (see also <http://www.dec.ny.gov/chemical/30951.html> for more information). This continuous rotating basin schedule allows for the comprehensive solicitation of available data and information, meaningful public participation and review, and more thoughtful dialogue and consideration of water quality assessments. In addition, the rotating basin approach is easier to manage than a biennial review of all waters of the state.

The 2010 United States Environmental Protection Agency (USEPA) Integrated Reporting Guidance (also cited in subsequent Guidance) recognized the value of the rotating basin approach and supports its use as an effective and practical means for assessing waters. However the guidance indicates that USEPA expects the states will continue to consider other existing and readily available data and information, regardless of basin and rotating schedule, when compiling Section 305(b) Reports and Section 303(d) Lists. To incorporate more recently collected data and information, particularly for waters that have not undergone a WI/PWL update during the most recent two-year Integrated Reporting cycle, **NYSDEC has established September 30 of the year prior to the issuing of a Section 305(b)/303(d) Integrated Report as the deadline for submitting additional data and information to be considered for inclusion in the Section**

305(b) assessment and 303(d) List. This deadline (6 months before the Integrated Report is due) provides time for NYSDEC to consider the additional data as well as some time for public stakeholder review and comment on proposed revisions to existing water quality assessments. However it is important that previous broader stakeholder input during the WI/PWL process is not arbitrarily set aside in light of new data that is not fully reviewed. Therefore NYSDEC may defer final consideration of new data until the next appropriate WI/PWL basin update.

Segmentation of Waterbodies

The delineation of waterbodies into discrete segments, or *assessment units*, must strike a balance between assessment units that are too small and specific, resulting in more segments than can be assessed with finite resources, and those that are too large and general, resulting in segments that are too diverse and difficult to assess accurately. Determining specific boundaries for waterbody assessment units is based on several factors, which are outlined in *USEPA Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) and 314 of the Clean Water Act*, July 29, 2005 (also cited in the 2014 IR Guidance). These factors include:

Waterbody Type: There are five surface waterbody types: Rivers and Streams, Lakes and Reservoirs, Estuary Waters, Great Lakes Shoreline and Ocean Coastline. Different waterbody types are maintained as separate assessment units. That is, lake waters are not combined with river reaches within the same assessment unit. Similarly, estuary waters, ocean coastline and Great Lakes shoreline are distinct waterbody types and are tracked as separate assessment units.

Hydrologic Drainage: Waterbodies that cross 10-digit Hydrologic Unit Code (HUC) watershed boundaries are usually broken into separate waterbody segments at the boundaries.

Surface Water Classification: A change in the waterbody class (A, B, C) of a waterbody usually necessitates the division of the waterbody into separate segments, since different classes of waters are assessed for the support of different designated uses. However, differences regarding the support of trout/cold water fisheries do not require separate segments. For waters with trout (T) or trout spawning (TS) designations and non-trout portions within the same segment, the resulting assessment of aquatic life reflects whether all portions of the assessment unit support the appropriate fish community for each portion. Similarly, Class A assessment units may also include Class A-S (Special), AA or AA-S (Special) waters since all support similar uses, including water supply use. The relatively few Class I marine waters in the state may also be combined with Class SC marine waters which support similar uses. Note however that some small reaches of Class A, B or C waters may be included in larger assessment units of a different class, if these smaller reaches are unlikely to be assessed separately. Typically Class D waters, of which there are relatively few, are combined with or evaluated as Class C.

Waterbody Length/Size: As a practical matter, assessment units should not be too large or too small. Also, where possible, there should also be some consistency with regard to segment size within waterbody types, although other factors may result in disparate assessment unit sizes. Considerations regarding the lengths/sizes of particular types of waterbody assessment units are outlined below.

Rivers and Streams – Generally, these assessment units include between 10 and 25 miles of stream length, but can be much longer where there are many tributaries to a primary stream and the watershed is of similar character. River and stream segments may be limited to main stem waters, or may include tributaries. Typically fifth-order streams and above are listed as *Main Stem* segments, without their tributaries, since they are significantly larger than many of their direct tributaries. Larger tributaries (or portions of tributaries) to Main Stem segments are considered as separate segments but in most cases include smaller tributary waters. Occasionally, smaller tributary waters to a larger main stem or lake are combined into one

segment, where land use, hydrologic boundaries and other commonalities indicate this is appropriate.

Lakes and Reservoirs – Lakes, ponds and reservoirs must be greater than 6.4 acres (0.01 square mile) to be included in the Waterbody Inventory. This is consistent with the threshold for inclusion in the *New York State Lake Gazetteer of Lakes, Ponds and Reservoirs* (DEC, 1987). Lake/Reservoir assessment units generally include the entire lake. However, some very large lakes (e.g., Lake Champlain, the Finger Lakes) may be segmented into multiple separate assessment units. Conversely, some lake chains and/or smaller lakes in more remote watersheds may be joined together as a single segment, if land use and other commonalities indicate this is appropriate. Ponds less than 6.4 acres may be included with the corresponding river/stream segment, with information regarding the lake reflected there.

Estuary Waters – Estuary assessment units are defined by physical features and waterbody classification with less consideration to consistency of size. Homogeneity of the waters within an estuary segment is a determining consideration.

Great Lakes Shoreline/Ocean Coastline – These segments are delineated to reflect hydrologic unit boundaries, waterbody classification, and political boundaries, with an attempt to be consistent with regard to size.

Land Use and Character: In addition, all waters within a single waterbody segment should drain areas of generally similar land use and character. If land use and overall character within a watershed changes, a separate assessment unit may be considered.

Because the factors used to segment waterbodies are fairly constant, the boundaries of waterbody assessment units rarely change. Assessment units are **not** defined solely by the length/size of area impacted by a water quality problem. Estimates of the extent of water quality impacts are often inexact and may change regularly. Therefore, using such information to establish segment boundaries would make management and updating of the Waterbody Inventory/Priority Waterbodies List considerably more difficult, while providing little added benefit.

Waterbody Use Support and Impacts

The assessment of New York State water resources is based on the ability of waters to support specific designated uses (see *Waterbody Uses* box). The specific uses that a waterbody is expected to support are determined by the classification of that waterbody (see also *Classifications – Surface Waters and Groundwaters* at <http://www.dec.ny.gov/regs/4592.html>). For example, only waterbodies designated Class A, AA, or A-Special are expected to support use as a potable *Water Supply Source*. Similarly *Shellfishing* use is limited to Class SA waterbodies. *Public Bathing* is an appropriate use in Class B and SB, as well as A, AA, SA, A-S. The remaining uses (*Recreation, Aquatic Life, Fish Consumption*) are expected to be supported in waterbodies of any classification. Additionally the *Habitat/Hydrology* and *Aesthetic* conditions of waters may also be evaluated. These conditions do not represent actual uses and are not evaluated as such. But they provide some context and explanation for the evaluation of the other designated uses.

Waterbody Uses

Water Supply Source
Shellfishing
Public Bathing
Recreation
Aquatic Life
Fish Consumption

Types of Evaluation Criteria

As noted previously, the evaluation of individual use support is based on a wide range of data and information. In some cases it is apparent when a use is not supported (e.g., beaches closed to public bathing or acid rain lakes devoid of fish). In other instances, support of a designated use is evaluated using established water quality criteria or other indicators of water quality. This methodology relies on three different types of evaluation criteria:

- Administrative Use Restrictions
- Numerical and Narrative Standards and Criteria
- Surrogate Water Quality Indicators

Administrative Use Restrictions are government agency-issued restrictions or closures of waters to specific uses. These restrictions are issued by regulatory agencies charged with protecting particular aspects of public health and are based on data collected through monitoring activities directed by those agencies. While the administrative restrictions are based on monitoring data, the raw data are not usually re-interpreted by NYSDEC in making its use support decisions; rather, the level of restriction already in place drives the use support determination. Examples of use restriction orders include water supply restrictions, fish consumption advisories, closed shellfishing areas, seasonal or conditional shellfishing areas, and public bathing beach closures.

Numerical (and Narrative) Water Quality Standards and Criteria are parameter-specific thresholds representing the allowable amount of substances in a waterbody, such that water uses are protected. In New York State, these standards are adopted in state regulations² while other criteria are established in formal NYSDEC guidance.³ For many substances the standard or criterion exists as a numeric value; for other parameters, the standard/criterion is more descriptive (narrative) in nature (e.g., *no increase in turbidity that will cause a substantial visible contrast to natural conditions*). Although the use of standards and criteria (particularly numeric standards/criteria) seems directly applicable to determining use support in ambient waters, an assessment methodology is necessary to address issues such as appropriate sampling methods, sampling location, sampling frequency or sample size, natural or background conditions, mixing zones, and so on.

Surrogate Water Quality Indicators are additional measures of water quality conditions not established in standards or formal criteria. These indicators are often used as numeric interpretations of narrative standards and provide more objective and consistent thresholds of impact and impairment. For example, it is difficult to say exactly when a waterbody changes from supporting to not supporting recreational activities. The use of water quality indicators brings added consistency to the evaluation of nutrient levels and clarity measurements, for example. Biological assessments, sediment toxicity evaluations, Section 319 nonpoint source assessments, source water assessments, dilution calculations and predictive models all reflect levels of water quality condition and use support without reliance on standards. Even where these indicators are more subjective, indicator-specific criteria help to maintain a degree of consistency and enable the incorporation of additional information into water quality assessments.

Sources of Data/Information

The water quality data and information used in making waterbody assessments are drawn from numerous DEC programs, as well as other federal, state and local government agencies, and a growing number of citizen organizations. Given the increasing involvement of local agencies and citizen volunteers in water

² New York Codes, Rules and Regulations, Title 6, Chapter X, Parts 700 – 706.

³ Division of Water Technical and Operational Guidance Series (1.1.1): Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998. Division of Water, NYSDEC.

quality monitoring activities, the WI/PWL updating process incorporates a significant public participation and outreach component that includes a network of local (county) Water Quality Coordinating Committees working in conjunction with the NYSDEC staff to capture additional water quality information to supplement the DEC monitoring data.

Adequacy of Data/Information

Due to the wide range of data and information sources, waterbody assessments begin with a determination of the adequacy of the available data and/or information. Data/information is reviewed with regard to its quantity, quality, relevance and clarity

(conclusiveness) of the data. As outlined in the Division of Water's Quality Assurance Management Plan *environmental data/information must be precise, unbiased, representative, complete, comparable, and sufficiently sensitive* in order to be used for conducting waterbody assessments. Water quality data/information is evaluated against specific thresholds to determine whether it meets these requirements and is adequate for evaluating use support or impacts. Typically if data/ information is to be used for conducting assessments, it must be collected by following the same procedures used by DEC (see box), or procedures modified by DEC to accommodate specific circumstances (such as for DEC-directed volunteer programs). If the data/information does not meet these thresholds, it may still be useful in identifying waterbodies for further investigation and verification of possible impacts.

Environmental Data Quality Assurance Criteria

- Data and information must conform to established procedures and standards (ANSI/ASQC E4 or equivalent USEPA requirements)
- Sample analysis must use established methods (40 CFR Part 136)
- Analytical laboratories must have appropriate certification (NYS DOH ELAP certified)
- Data/information should not be more than 10 years old.

Evaluation of Use Support and Impacts

After all readily available water quality data and information for a waterbody are collected and evaluated for adequacy, evaluations are made regarding the following:

- the specific use(s), if any, that is/are affected
- the severity of the impact on the use(s)
- the level of confidence corresponding to the evaluation of use support/impact

If a use is affected, the severity of the impacts to the use (i.e., the degree to which the use is restricted) is evaluated as either *Precluded*, *Impaired*, *Stressed*, or *Threatened* (see *Waterbody Use Impact Levels* box). If the uses are not affected, the use is evaluated as *Fully Supported*. If data is inadequate to evaluate support of a use, it is noted as *Unassessed*. The severity of use impact depends upon a number of factors, including the *magnitude* of the impact, the *frequency* of occurrence and the *spatial extent* of the affected area.

Magnitude relates to the level of the impact to the use or the degree of use restriction and is reflected in the level of severity. For example, fish consumption advisories may recommend eating no more than one meal of fish per week (*Stressed*), eating no more than one meal per month (*Impaired*), or eating no fish at all (*Precluded*). For evaluations using numeric criteria, ambient concentrations may be near the applicable criterion (*Stressed*), above the criterion (*Impaired*) or well above the criteria (*Precluded*).

Frequency refers to how often a water quality condition occurs and is also reflected in the level of severity. The more frequently a specific condition occurs, the more significant the effect and the higher the assigned level of severity. For example, a bathing beach might be closed for one or two days in a season (*Stressed*), or for multiple weeks (*Impaired*), or for the entire season (*Precluded*).

Waterbody Use Impact Levels of Severity

PRECLUDED

Frequent/persistent water quality, or quantity, conditions and/or associated habitat degradation *prevents all aspects* of a specific waterbody use.

IMPAIRED

Occasional water quality, or quantity, conditions and/or habitat characteristics *periodically prevent* specific uses of the waterbody, or;

Waterbody uses are not precluded, but some aspects of the use are *limited or restricted*, or;

Waterbody uses are not precluded, but *frequent/persistent* water quality, or quantity, conditions and/or associated habitat degradation *discourage* the use of the waterbody, or;

Support of the waterbody use *requires additional/advanced* measures or treatment.

STRESSED

Waterbody uses are not significantly limited or restricted (i.e. uses are supported and water quality standards met), but *occasional* water quality, or quantity, conditions and/or associated habitat degradation *periodically discourage* specific uses of the waterbody.

THREATENED

Water quality supports waterbody uses, water quality standards are met and ecosystem exhibits no obvious signs of significant stress (i.e., uses are *Fully Supported*), however:

Changing land use patterns may result in restricted use or ecosystem disruption, or;

Worsening trends or sub-optimum water quality suggest future impacts to uses, or;

Support of a specific/distinctive use (e.g., Class AA waters) make the water more susceptible to water quality threats.

Spatial extent of the water quality impact (i.e., the percent of total waterbody affected) is also reflected in the level of severity. For example, the severity of shellfishing use impact in a bay varies depending upon whether shellfishing is restricted in one small cove covering less than 10% of the bay area (*Stressed*), or a larger portion of the bay area (*Impaired*) or the entire bay (*Precluded*).

If there are no restrictions or impacts to uses, then the use is considered to be *Fully Supported*. In some cases, uses that are *Fully Supported* might be more appropriately evaluated as *Threatened*. *Threatened* uses occur where there are no current restrictions or impacts to uses, but where specific conditions suggest that future impacts are likely due to changing land use patterns, declining trends or sub-optimum water quality, or the presence of conditions that make a waterbody more vulnerable to impacts.

If none of the available data/information are adequate for evaluating use support or impacts, then that use is considered to be *Unassessed*.

Tables 1 through 9 provide use-specific criteria that relate water quality monitoring data and information to the severity of impacts and the evaluation of use support.

Confidence in the Evaluation of Use Support/Impact

The evaluation of use support/impact also includes an indication of the level of confidence associated with the assigned severity. If the quantity, quality, relevance and clarity of the data and information used to make the evaluation meet appropriate thresholds and clearly indicate a specific level of impact, then confidence in the assigned level of impact is considered to be *Known*. If the data are adequate but point to multiple levels of severity or are otherwise inconclusive, then confidence in the assigned level of impact is considered to be *Suspected*. If the quality and/or quantity of data is not adequate to confidently determine

use support or impact, confidence in the assigned level of impact is considered to be *Unconfirmed* (formerly *Possible*). In cases where the data/information is particularly lacking, it may be more appropriate to indicate the level of use support/impacts being *Unassessed*, rather than selecting a level of severity in which there is little confidence.

Confidence in an evaluation of use support/impact is also influenced by the age of the data upon which the evaluation is based. Typically, if there are no data/information to reconfirm a determination of use support as *Known* that was made more than ten years ago, that level of confidence may be changed to *Suspected*.⁴ Similarly, if an original determination that a *Suspected* use impact is more than ten years old it may be appropriate to change the level of confidence to *Unconfirmed* if corrective actions have been implemented or there are other reasons to believe water quality has improved. If an evaluation of a *Fully Supporting* use has not been reconfirmed in more than ten years, the level of confidence of that evaluation should be considered *Unconfirmed*, unless that waterbody is so remote or there are other circumstances suggesting there have been no intervening anthropogenic impacts to the use such that it is reasonable to assume the evaluation of *Fully Supporting* use remains valid.

Use Impact Evaluation Confidence Levels

Known – Adequate water quality monitoring data and information clearly indicate that the use of the waterbody is restricted to the degree indicated by the assigned severity.

Suspected – Adequate water quality data and information suggests the use of the waterbody is restricted to the degree indicated by the assigned severity. However conflicting indicators or uncertainty regarding the severity of impact requires further evaluation of existing (or perhaps additional data in order to determine appropriate restoration/protection actions.

Unconfirmed – Limited information lacking in quantity, quality or clarity indicate that uses *may be restricted*. However, additional data is necessary to determine whether there are any actual impacts to uses. Anecdotal evidence and/or public complaints without supporting data may be qualified as Unconfirmed.

Specific Waterbody Use Support Evaluation Criteria

The following pages discuss various specific uses (and conditions) for evaluating waterbodies of the state. For each uses a table outlines criteria used to determine the degree to which a waterbody supports that use. These tables are not intended to be all inclusive; there may be other information about a waterbody not captured in the table that is helpful in evaluating use support. Additionally, the criteria in the tables should be considered to be guidance, with flexibility to consider the wide range of specific circumstances that might occur with an individual waterbody but cannot be succinctly included here.

...the criteria in the tables should be considered to be guidance, with flexibility to consider the wide range of specific circumstances that might occur...

It is important that the resulting evaluations of uses are consistent with other determinations of use support that are conducted by other agencies charged with the protection of public health. Consequently for uses that include a public health component (*Water Supply Source, Shellfishing, Fish Consumption and Public Bathing*), the threshold for designating a waterbody as not supporting the use (i.e., *Impaired or Precluded*) will be determined by the presence/absence and type of Administrative Use Restrictions issued by the agency or program responsible for the public health protection of this use.

Because there are no specific Administrative Use Restrictions that apply to most general *Recreation* uses

⁴ A reduction in the level of confidence over time is more typical for waters where uses were evaluated as *Fully Supported* but not reconfirmed, than it is for waters evaluated as having impacts to uses. This is because it is generally less likely that impacts would diminish over time without some action taken to alleviate the impacts.

and the support of *Aquatic Life*, the evaluation of these uses is based on NYSDEC established water quality standards, criteria and indicators. For waters where there is regulated *Public Bathing* use, Administrative Use Restrictions and resulting *Public Bathing* use evaluations are also incorporated into the evaluation of *Recreation* use support.

Source of Potable Water Supply Use

An evaluation of use as a potable *Water Supply Source* is conducted only for those waters designated as Class A, AA or A/AA-Special. This evaluation applies to the quality of the ambient water supply source prior to withdrawal, treatment and distribution for use as potable water. However in order to maintain consistency with the New York State Department of Health (NYSDOH) and local health departments – which are primarily responsible for overseeing public water supplies in the state – the evaluation of water supply source use also relies on water quality information, monitoring data and assessments conducted by health departments and water treatment operators. Health departments and operators focus to a greater extent on the quality of the water supply after the application of treatment appropriate for meeting drinking water criteria at the tap. Although these two assessments are separate and distinct, they obviously are closely related and together they provide a comprehensive approach to assessing water supply source use.

The starting point for an evaluation of water supply source use is the presence or absence of health department-issued administrative advisories/restrictions on the use of a finished (i.e., treated) water at the tap. Additionally the use of a source may be discontinued either temporarily or permanently due to water quality concerns. An assessment of water supply source use is complicated by the fact that the evaluation of a raw (untreated) water supply at its source may, under some circumstances, differ from the assessment of that water after treatment. For example, water supply source use may be evaluated as *Impaired* if it does not meet Class A water quality standards, even if drinking water standards are met at the tap by virtue of additional (“extraordinary”) treatment. On the other hand, waters drawn from reservoirs that are *Fully Supporting* water supply source use may be subject to administrative advisory or restriction if, for example, distribution system failures result in contamination at the tap.

Administrative advisories/restrictions and/or the suspension of use of a water supply source are well aligned with *Precluded* and *Impaired* uses. They do not, however, identify lesser impacts or threats that could lead to future impairments. Because of human health implications, threats to and protection of water supply source use take on added significance. Consequently additional criteria are used by NYSDEC to identify stresses and threats – as well as some impairments – to drinking water sources. These additional criteria take into account the frequency of contaminant concentrations exceeding NYSDEC ambient water quality standards for protection of health (water supply), the level of treatment necessary to meet drinking water criteria at the tap, and natural sensitivity and susceptibility as determined through the NYSDOH Source Water Assessment Program (SWAP).

With regard to level of treatment, a water supply that requires *extraordinary* treatment may be evaluated as having impaired water supply source use. Given national filtration rules and other considerations, defining “extraordinary” is somewhat difficult. The criteria language used in Table 1 to define extraordinary treatment is taken from the language used in the New York State Water Quality Regulations (6 NYCRR Part 701) for classification of Class A and AA waters.

The relationship between the evaluation of water supply source use and drinking water supply advisories, ambient monitoring data, level of treatment, SWAP determinations and other information is outlined in Table 1.

Table 1 Potable Water Supply Source Use Evaluation Criteria

Use Evaluation Criteria	Severity																		
<p>Conditions Frequently/Persistently Prevent Use</p> <ul style="list-style-type: none"> • NYS/local Health Department discontinues use of the water supply or issues advisories/restrictions¹ lasting >30 days. 	Precluded																		
<p>Conditions Occasionally Prevent or Frequently Discourage Use</p> <ul style="list-style-type: none"> • NYS/local Health Department discontinues use of the water supply or issues advisories/restrictions¹ lasting up to 30 days, or • Conditions do not require advisories or use restrictions but additional treatment beyond conventional processes² is required to remove any impurities that are not naturally present, or • Monitoring shows exceedence of maximum contaminant levels (MCLs) in finished water, or • Monitoring data show exceedence of one or more parameter-specific use evaluation criteria*³ 	Impaired																		
<p>Conditions Occasionally Discourage Use</p> <ul style="list-style-type: none"> • SWAP determination of <i>very high susceptibility</i>,⁴ or • Elevated DBP/THM potential,⁵ or • Presence of harmful algal bloom (HABs) in proximity to water intakes,⁶ or • Monitoring data show exceedence of one or more parameter-specific use evaluation criteria* <i>value</i> more than 10% of the time. 	Stressed																		
<p>Conditions Fully Support Uses</p> <ul style="list-style-type: none"> • No drinking water restrictions, and • No additional treatment required, and • No significant contaminants/threats present. 	Fully Supported																		
<p>Conditions Support Use, but Specific Threats Noted</p> <ul style="list-style-type: none"> • SWAP determination of <i>high susceptibility</i>,⁴ or • Presence of harmful algal bloom (HABs),⁶ or • No other specific use evaluation criteria; see definition of <i>Threatened</i>.⁷ 	Threatened																		
<p>* Parameter-Specific Use Evaluation Criteria</p> <table border="0"> <tr> <td>Coliform, Total (monthly median)</td> <td>50⁸</td> <td>/ 100 ml</td> </tr> <tr> <td>Coliform, Fecal (geometric mean)</td> <td>200</td> <td>/ 100 ml</td> </tr> <tr> <td>Cryptosporidium, average</td> <td>7.5</td> <td>oocysts/100 L</td> </tr> <tr> <td>Ammonia/Ammonium</td> <td>20</td> <td>mg/l</td> </tr> <tr> <td>Nitrate, as N</td> <td>10</td> <td>mg/l</td> </tr> <tr> <td>other substances (source water)</td> <td colspan="2">WQS/GV⁹</td> </tr> </table>		Coliform, Total (monthly median)	50 ⁸	/ 100 ml	Coliform, Fecal (geometric mean)	200	/ 100 ml	Cryptosporidium, average	7.5	oocysts/100 L	Ammonia/Ammonium	20	mg/l	Nitrate, as N	10	mg/l	other substances (source water)	WQS/GV ⁹	
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other substances (source water)	WQS/GV ⁹																		
<p>¹ Advisories/restrictions and discontinuation of use are based on source water quality/contamination. ² For Class A waters, conventional processes include coagulation, sedimentation, filtration and disinfection; for Class AA waters, conventional processes include disinfection. ³ In the absence of accompanying advisories/restrictions or other indicators of impaired use, this impairment may be noted as <i>Suspected</i> or <i>Unconfirmed</i>. ⁴ Impacts/impairments based on SWAP susceptibility determinations may be noted as <i>Suspected</i>. ⁵ Chlorophyll a of 4 ug/l (Class AA) or 6 ug/l (Class A). ⁶ As defined by NYSDEC Harmful Algal Bloom notification criteria; occurrence on multiple days and verified over more than a 2 week period, at multiple locations covering significant spatial extent, with likelihood of annual recurrence. ⁷ <i>Threatened</i> waters include those waters where uses are <i>Fully Supported</i>, however: 1) changing land use patterns may result in restricted use or ecosystem disruption, or; 2) decreasing trends or sub-optimum water quality suggest future impacts, or; 3) support of a specific/distinctive use make the waterbody more susceptible to water quality threats. ⁸ Application of this criterion is limited to Class AA waters. ⁹ Refers to substances for which there are NYSDEC Health (Water Source) ambient water quality standards, guidance values.</p>																			

Shellfishing Use

Support of *Shellfishing* use is evaluated for Class SA marine waters. These evaluations reflect the level of certification of the waters for the taking of shellfish as determined by the DEC Division of Fish, Wildlife and Marine Resources (DFWMR) and based on NYSDEC regulations (6NYCRR, Part 47, *Certification of Shellfish Lands*) and National Shellfish Sanitation Program (NSSP) requirements. However, the assessments contained in the WI/PWL and reflected in the Section 303(d) List of Impaired/TMDL Waters are updated infrequently and are not a substitute for the more regularly maintained shellfishing certification designations provided by DFWMR. More information regarding the NYSDEC Shellfishing program can be found at <http://www.dec.ny.gov/outdoor/345.html>.

Shellfishing waters that are not certified as safe for the taking shellfish may be subject to regulatory closures that are in effect year-round (uncertified), or for a portion of the year (seasonally certified). The criteria for evaluation of the shellfishing use are based on the frequency, duration, and extent of the shellfish harvesting closures for specific waterbodies. The relationship between level of certification for the taking of shellfish and shellfishing use support is reflected in Table 2.

Table 2 Shellfishing Use Evaluation Criteria	
Use Evaluation Criteria	Severity
<p>Conditions Frequently Prevent Use</p> <ul style="list-style-type: none"> • NYSDEC DFWMR has designated more than 25% of the waterbody area as uncertified year-round for shellfishing, or • DFWMR has designated more than 10% of the waterbody area as uncertified year-round and shellfishing in remaining area is only seasonally certified. 	Precluded
<p>Condition Occasionally Prevent or Frequently Discourage Use</p> <ul style="list-style-type: none"> • DFWMR has designated 10 to 25% of the waterbody area as uncertified year-round • DFWMR has designated more than 25% of the waterbody area as only seasonally certified 	Impaired
<p>Conditions Occasionally Discourage Use</p> <ul style="list-style-type: none"> • DFWMR has designated some/up to 10% of the waterbody area as uncertified year-round, with the remainder of the waterbody certified for shellfishing use, or • DFWMR has designated some/up to 25% of the waterbody area as seasonally certified, with the remainder of the waterbody certified for shellfishing use, 	Stressed
<p>Conditions Fully Support Use</p> <ul style="list-style-type: none"> • DFWMR has designated the entire waterbody as certified for the taking of shellfish and all significant tributary waters are also certified. 	Fully Supported
<p>Conditions Support Use, but Specific Threats Noted</p> <ul style="list-style-type: none"> • DFWMR has designated up to 10% of the waterbody area as uncertified or seasonally certified, or • DFWMR has designated the waterbody as certified, but significant tributary waters are uncertified, or • DFWMR has designated the entire waterbody as certified but temporary closures result in shellfishing closures for more than one month out of the year. 	Threatened

Regulatory shellfishing closures are driven by water quality sampling results, visual shoreline surveys, or a combination of the two. Water quality sampling-based closures are the result of actual bacteriological monitoring and subsequent findings that the waters do not support safe consumption of shellfish. Shoreline surveys are visual assessment of actual or potential sources of contamination that DFWMR determines

shellfishing in such waters cannot be certified. Whereas certification of waters as safe for the taking of shellfish for human consumption requires regular sampling to demonstrate compliance with NSSP standards, waters can be designated as uncertified based on actual/potential sources identified in shoreline surveys without supporting data. Typically, such sources are documented discharges to the water and/or the presence of marinas and other areas where boat traffic is high. In cases where shoreline surveys and or the identification of potential sources rather than actual water quality sampling data are the basis of an impairment determination, that determination may be considered to be *Suspected*, rather than *Known*. Where potential sources result in uncertified waters but water quality data demonstrates compliance with NSSP standards, shellfishing use may be assessed as *Threatened*.

In addition to regulatory closures, NYSDEC also issues *temporary emergency closures*, and *special shellfishing closures*. Temporary emergency closures occur when an area that is normally open experiences sudden, short-term degradations in water quality. This could be due to an excessive amount of stormwater runoff or the presence of a biotoxin produced by naturally occurring marine algae in the water. Once the event that caused the poor water quality has passed and water quality has improved, the area is reopened to harvesting. Special shellfishing closures are implemented when predictable conditions pose a threat to water quality. These usually occur during high use periods, such as holidays and special events, when increased numbers of mooring boats increases the possibility that boaters may occasionally discharge waste overboard. Because temporary emergency and special closures are typically of shorter duration after which the affected waterbody returns to supporting shellfishing use, these closures are not usually incorporated into the WI/PWL assessment of water quality and shellfishing use support. Such closures are only factored into the shellfishing use evaluations when their frequency causes a certified area to be closed for longer duration or multiple episodes.

In addition to the temporary closure of waters that have been certified as safe for shellfishing, there are also instances where the opposite occurs. That is, an uncertified area may be temporarily or conditionally opened to shellfishing. However, these *conditional certifications* are not sufficient justification to reduce the severity of impact for waters that are otherwise uncertified, and assessed as such.

It is also worth noting that there are widely varying levels of water quality data, to complement shoreline surveys, upon which the certification decisions for these waters are made. Local water quality protection and restoration programs as well as regulatory program managers are encouraged to look beyond the shellfishing closure-based WI/PWL assessments for monitoring data specific to the program needs in order to guide their actions.

Public Bathing Use and Recreation Use

Whereas an evaluation of general *Recreation* use is appropriate for all waters, regardless of classification, the evaluation of the more narrowly-defined *Public Bathing* use is limited to those waters classified specifically for primary contact recreation (i.e., Class B, SB, A, AA, A/AA-S and SA). Such classifications apply to waters specifically designated as suitable for public beaches. Public bathing areas see an increased level of swimming use and, as a result, are required to be regularly monitored by public health agencies. State and local/county health departments conduct regular bacteriological sampling and perform sanitary surveys at these designated public bathing areas. Based on the findings of the sampling and surveys, bathing use may be restricted for either short-term or extended periods of time. Temporary closures may also occur due to contamination by spills, algal blooms, waterfowl, or runoff from wet-weather events.

Public Bathing Use

Evaluation of the *Public Bathing* use is based primarily on public health and safety concerns, particularly bacteriological contamination, algal blooms and water clarity. Consequently the assessment criteria are linked primarily to beach closures associated with these safety concerns. Indicators that reflect nuisance conditions rather than health and safety concerns are addressed in the assessment of general Recreation use.

It should be noted that although Class C and SC waters also include primary contact recreation as a possible specified designated use, the natural physical characteristics of these waters may make them unsuitable for use as public beaches and bathing areas. Therefore these waters are evaluated for support of Recreation use, but not public bathing use. For a more detailed discussion of evaluation of these waters, see *Recreation Use* below.

The relationship among bathing restrictions, water quality monitoring and other indicators and the level of public bathing use support is shown in Table 3.

Table 3 Public Bathing Use Evaluation Criteria																
Use Evaluation Criteria	Severity															
<p>Conditions Frequently Prevent Use</p> <ul style="list-style-type: none"> • NYS/County Health Department or local health agency has issued a closure¹ of public bathing beach(es) in the waterbody for period of more than 25 days. 	Precluded															
<p>Condition Occasionally Prevent or Frequently Discourage Use</p> <ul style="list-style-type: none"> • NYS/County Health Department or local health agency has issued temporary/occasional closures¹ of public bathing beach(es) in the waterbody for between 10 and 25 days. • Monitoring data show exceedence of one or more parameter-specific use evaluation criteria,* but no closures have been issued.² 	Impaired															
<p>Conditions Occasionally Discourage Use</p> <ul style="list-style-type: none"> • NYS/County Health Department or local health agency has issued temporary/occasional closures of public bathing beach(es) in the waterbody for less than 10 days. • Additional measures (e.g., aquatic weed/algae control) are deemed necessary to support public bathing use. • Monitoring data show exceedence of one or more parameter-specific use evaluation criteria* <i>values</i> more than 10% of the time. • Recreation use of the waterbody is evaluated as <i>Precluded</i> or <i>Impaired</i>. 	Stressed															
<p>Conditions Fully Support Use</p> <ul style="list-style-type: none"> • NYS/local Health Department has not closed/restricted swimming, and • Additional measures are not necessary for support of swimming use, and • Monitoring data does not exceed use evaluation criteria. 	Fully Supported															
<p>Conditions Support Use, but Specific Threats Noted</p> <ul style="list-style-type: none"> • No specific use evaluation criteria; see definition of <i>Threatened</i>.³ 	Threatened															
<p>* Parameter-Specific Use Evaluation Criteria</p> <table border="0"> <tr> <td>Coliform, Total (geometric median)</td> <td>2,400</td> <td>per 100 ml</td> </tr> <tr> <td>Coliform, Fecal (geometric mean)</td> <td>200</td> <td>per 100 ml</td> </tr> <tr> <td>Enterococci (geometric mean), freshwater</td> <td>33</td> <td>per 100 ml</td> </tr> <tr> <td>Enterococci, (geometric mean), marine water</td> <td>35</td> <td>per 100 ml</td> </tr> <tr> <td>Clarity, mean (Secchi Disc)</td> <td>1.2</td> <td>meters</td> </tr> </table>		Coliform, Total (geometric median)	2,400	per 100 ml	Coliform, Fecal (geometric mean)	200	per 100 ml	Enterococci (geometric mean), freshwater	33	per 100 ml	Enterococci, (geometric mean), marine water	35	per 100 ml	Clarity, mean (Secchi Disc)	1.2	meters
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<p>¹ Closures are based on ambient water quality/contamination.</p>																
<p>² In the absence of health agency monitoring and/or closure/restriction for swimming use, impairments may be noted as <i>Suspected</i> or <i>Unconfirmed</i>.</p>																
<p>³ <i>Threatened</i> waters include those waters where uses are <i>Fully Supported</i>, however: 1) changing land use patterns may result in restricted use or ecosystem disruption, or; 2) decreasing trends or sub-optimum water quality suggest future impacts, or; 3) support of a specific/distinctive use make the waterbody more susceptible to water quality threats.</p>																

Recreation Use

The use category of *Recreation* tracks impacts and impairments to a more expansive list of recreational activities, such as fishing, boating, water skiing, rafting, wading and other primary and secondary contact activities, including swimming. Recreation uses also apply to waters of all classifications. The requirement that all waters support recreation uses addresses the federal Clean Water Act goal that all waters be *swimmable*.⁵ However as a practical matter not all waters of the state are suitable for swimming, due to factors other than water quality. Nor are all waters regularly monitored to assess swimming use support to the same degree that designated public bathing areas are.

The evaluation of public bathing use focuses primarily on public health concerns, and relies largely on beach closure information associated with required pathogen monitoring at designated public beaches and bathing areas. As a practical matter, not all waters of the state are regularly monitored for pathogens to assess swimming use support to the same degree that designated public bathing areas are. The assessment of recreation uses in Class C, D and SC waters typically relies on indicators of excessive algal and weed growth, turbidity/clarity conditions, low dissolved oxygen or other conditions that affect recreational fishing, and other conditions that impact recreational activity. The public bathing pathogen criteria may also be used to evaluate recreation use support where such monitoring data is available and where the use of this criteria is necessary to protect human health.

As a practical matter, not all waters of the state are regularly monitored for pathogens to assess swimming use support to the same degree that designated public bathing areas are. The public is advised to exercise caution with regard to recreation in waters that are not designated as public bathing areas. Concerns to public safety include high flows/strong currents, excessive wind and waves, unknown depth, debris, diminished water clarity and unknown contaminants.

Additionally NYSDEC monitoring of these surface waters is to determine the average or typical water quality and the Department does not continuously monitor water quality in these waters. The public is advised to exercise caution with regard to recreation in waters that are not designated as public bathing areas. Concerns to public safety include high flows/strong currents, excessive wind and waves, unknown depth, debris, diminished water clarity and unknown contaminants.

Excessive nutrient levels – which may increase turbidity, lower dissolved oxygen, and promote aquatic plant and algal growth – may also impact the use of lakes, ponds and reservoirs for recreation activities. NYSDEC has established a narrative water quality standard for nutrients (phosphorus and nitrogen) that prohibits “*amounts that will result in growths of algae, weeds and slimes that will impair the waters for their best usages.*” The Department is currently developing companion numeric nutrient criteria to supplement the narrative criteria. Until that effort is complete, the criteria for chlorophyll *a* (when accompanied by elevated nutrients) and presence of harmful algal blooms (HABs) will be used as surrogate indicators for the assessment of nutrient impacts and corresponding impairments to recreational use.

NYSDEC has also established a total phosphorus criterion of 20 µg/l for the protection of recreation use in lakes. The criterion was developed from lake user survey data and is based on *aesthetic effects for primary and secondary contact recreation*. As such, the criterion is indicative of elevated nuisance conditions and slight impacts to recreation in lakes and is more closely aligned with *Stressed/Threatened* level of impact than with *Impairment*. Because of its basis, this criterion is more appropriate in assessing the general *Aesthetic* condition of a waterbody. See also discussion of *Aesthetic Condition* below.

⁵ In order to meet the federal Clean Water Act goal that all waters be “swimmable,” water quality of New York State waters Class C, SC (and above) “shall be suitable for primary and secondary contact recreation.” However, other factors (such as flow/depth, access, conflicting use) may limit this use. (See NYS Classifications for Surface Waters, Part 701.1 thru 701.14.)

Aquatic Life Use Support

The support of *Aquatic Life* is one of two primary uses – the other being *Recreation* – that are the main focus of the NYSDEC statewide waters monitoring and assessment efforts. There are a number of reasons for this emphasis:

- *Aquatic Life* use support must be maintained in all waters, regardless of classification
- *Aquatic Life* use support is one of the most sensitive of the use support categories
- *Aquatic Life* use support can be effectively assessed easily and economically using biological sampling techniques (for rivers and streams)
- *Aquatic Life* use protection is primarily the responsibility of DEC environmental programs; unlike *Water Supply Source*, *Shellfishing*, *Fish Consumption* and *Public Bathing* uses, which have significant human health components.

Biological sampling data, dissolved oxygen, and pH measurements are used to determine *Aquatic Life* use support. The NYSDEC monitoring and assessment of rivers and streams relies primarily on biological sampling as a direct indicator of aquatic life use support and as an integrator of dissolved oxygen and pH conditions. The primary assemblage used is macroinvertebrates; however periphyton and fish community assessments may also be used.

The relationship between the sampling results based on NYSDEC biological monitoring protocols⁶ and the corresponding level of aquatic life use support is shown in Table 5. The table reflects that the four levels of macroinvertebrate impact used in the NYSDEC Stream Biomonitoring Program (Severely, Moderately, Slightly and Non-impacted) generally correspond to the levels of severity of use support (*Precluded*, *Impaired*, *Stressed/Threatened*,⁷ *Fully Supported*) for aquatic life. In some circumstances the biological community may be negatively affected by habitat or hydrologic factors, rather than water quality. Such conditions include the alteration of riparian corridors, poor sampling substrates, the presence of upstream impoundments, and some natural conditions such as low gradient or reduced flow. These habitat and/or hydrology conditions can be evaluated using the Habitat Model Affinity (HMA) metric. When the HMA indicates that the habitat/hydrology is less than optimal, the Aquatic Life Use evaluation confidence level may be adjusted to reflect that the use evaluation may be influenced by habitat/hydrology considerations. In such cases, these findings will also be reflected in the evaluation of Habitat/Hydrology condition of the waterbody. See discussion of *Habitat/Hydrology Condition* below.

In addition to the integrated assessment provided by biological sampling, NYSDEC also uses both dissolved oxygen and pH as indicators of aquatic life use support. For many waters, NYS water quality standards for the protection of aquatic life specify that dissolved oxygen in waters should not be less than a specific standard “at any time.” In some instances this “never less than” condition is qualified to exempt waters where low dissolved oxygen is the result of natural conditions or variations; for other waters, the natural conditions/variations exception is not explicit. However, whether explicitly stated or not, assessments of use support based on dissolved oxygen should recognize that low dissolved oxygen at lower depths of non-flowing waters (i.e., lakes and impoundments) or in areas of poor aeration, circulation or natural organic loadings are likely to occur. However such naturally occurring areas of low dissolved oxygen are usually limited and can often be avoided by fish. As a result such conditions have little if any impact on overall ability of the waterbody to support a healthy aquatic community.

⁶ The details of biological monitoring assessment are described in *Standard Operating Procedure: Biological Monitoring of Surface Waters in New York State*. NYSDEC SOP #208-12. Division of Water, New York State Department of Environmental Conservation, 625 Broadway, Albany, New York. 2012.

⁷ *Slightly Impacted* represents a broad range of conditions that may correspond to either *Stressed* or *Threatened* aquatic life use support.

Table 5 Aquatic Life Use Support Evaluation Criteria	
Use Evaluation Criteria	Severity
Conditions Frequently Prevent Use Biological Assessment Profile (BAP) of between 0 and <2.5 (corresponding to <i>Severely Impacted</i> conditions, considered <i>Very Poor</i> water quality), with no significant Habitat/Hydrology influences. ¹	Precluded
Conditions Occasionally Prevent or Frequently Discourage Use Biological Assessment Profile (BAP) of between 2.5 and <5.0 (corresponding to <i>Moderately Impacted</i> conditions, considered <i>Poor</i> water quality), with no significant Habitat/Hydrology influences. ¹	Impaired
Conditions Occasionally Discourage Use Biological Assessment Profile (BAP) of between 5.0 and <7.5 (corresponding to a broad range of <i>Slightly Impacted</i> conditions, considered <i>Fair to Good</i> water quality), with no significant Habitat/Hydrology influences. ¹ At the higher end of this BAP range where the biological community is most similar to natural conditions, aquatic life use may be evaluated as <i>Threatened</i> .	Stressed ²
Conditions Support Use, but Threats Noted Biological Assessment Profile (BAP) corresponding to the upper range of <i>Slightly Impacted</i> conditions) with no obvious or significant impacts indicated by <i>Impact Source Determination</i> (ISD).	Threatened
Conditions Fully Support Use Biological Assessment Profile (BAP) of ≥ 7.5 (corresponding to <i>Non-Impacted</i> conditions, considered <i>Very Good</i> water quality)	Fully Supported
¹ In some circumstances, BAP scores may be influenced by habitat/hydrology alterations, as measured by Habitat Model Affinity (HMA ≤ 69). Such extenuating conditions will be reflected in the Habitat/Hydrology Conditions evaluation (as <i>Fair</i> or <i>Poor</i>), and may influence the Aquatic Life Use evaluation confidence level.	

Variations in natural conditions also apply to the use of pH data in the determination of Aquatic Life use support. Chemical data collected in conjunction with biological data of streams, lakes and ponds subject to atmospheric deposition/acid rain provide evidence that waters with pH levels somewhat outside the 6.5 to 8.5 range specified in NYS water quality standards may still be supportive of aquatic life. As a result, the evaluation of Aquatic Life use support using pH data should also take into account natural conditions and variability, as well as consideration of the magnitude, frequency, duration and spatial extent of exceedences of water quality standards.

NYSDEC has worked with USEPA to develop appropriate language to recognize and allow for natural conditions and variation regarding dissolved oxygen and pH results that fall outside established numeric ranges but that do not result in designation of the water as not supporting uses, provided other (biological) indicators indicate no impact to Aquatic Life use.⁸ This language – which will be proposed for adoption in the next NYS Water Quality Standards Rulemaking – is reflected in the assessment criteria for dissolved oxygen and pH outlined in Table 6.

⁸ USEPA in earlier *Guidelines for the Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates* (USEPA, 1997) includes low dissolved oxygen (and low pH) caused by poor aeration or natural organic materials among its examples of what might be considered naturally occurring.

Table 6 Aquatic Life Use Support Evaluation Criteria For Dissolved Oxygen, pH

Use Evaluation Criteria	Severity						
<p>Conditions Frequently Prevent Use</p> <ul style="list-style-type: none"> No values meeting minimum dissolved oxygen criteria* are observed. Representative pH values are less than 5.0 or greater than 10.0. 	Precluded						
<p>Conditions Occasionally Prevent or Frequently Discourage Use</p> <ul style="list-style-type: none"> Monitoring data show minimum dissolved oxygen criteria* is not met more than 25% of the time, or Representative pH values are between 5.0 and 6.0 or between 9.0 and 10.0, or Representative pH values are between 6.0 and 6.5 and acid neutralizing capacity (ANC_{OAA}) is less than 11 ueq/l, or Representative pH values are between 8.5 and 9.0, and fish/biological surveys indicate pH-related impacts. 	Impaired						
<p>Conditions Occasionally Discourage Use</p> <ul style="list-style-type: none"> Monitoring data show minimum dissolved oxygen criteria* is not met between 10% and 25% of the time. Representative pH values are between 6.0 and 6.5 and acid neutralizing capacity (ANC_{OAA}) is 11 ueq/l or more, or Representative pH values are between 8.5 and 9.0, but fish/biological surveys indicate no pH-related impacts.¹ 	Stressed						
<p>Conditions Fully Support Use</p> <ul style="list-style-type: none"> Monitoring data show minimum dissolved oxygen criteria* is met, and Representative pH values are between 6.5 and 8.5, and No fish/biological impacts due to water quality have been documented. 	Fully Supported						
<p>Conditions Support Use, but Threats Noted</p> <ul style="list-style-type: none"> No specific use evaluation criteria; see definition of <i>Threatened</i>.² 	Threatened						
<p>* Parameter-Specific Use Evaluation Criteria</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 60%;">Dissolved Oxygen, Trout Spawning (daily average)³</td> <td style="text-align: right;">7.0 mg/l</td> </tr> <tr> <td>Dissolved Oxygen, Trout (daily average)³</td> <td style="text-align: right;">6.0 mg/l</td> </tr> <tr> <td>Dissolved Oxygen, non-Trout (daily average)³</td> <td style="text-align: right;">5.0 mg/l</td> </tr> </table>		Dissolved Oxygen, Trout Spawning (daily average) ³	7.0 mg/l	Dissolved Oxygen, Trout (daily average) ³	6.0 mg/l	Dissolved Oxygen, non-Trout (daily average) ³	5.0 mg/l
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Dissolved Oxygen, non-Trout (daily average) ³	5.0 mg/l						
<p>¹ Note that waters having pH between 6.0 and the minimum pH water quality standard of 6.5, but where biological sampling suggests that aquatic life is supported, may be listed as Waters Needing Verification of Impact. This is consistent with a <i>weight of evidence</i> approach and recognizes that because biological samples represent an integrator of all water quality conditions and are also a direct measurement of aquatic life, biological assessments are often given more weight in evaluating Aquatic Life use support.</p>							
<p>² <i>Threatened</i> waters include those waters where uses are <i>Fully Supported</i>, however: 1) changing land use patterns may result in restricted use or ecosystem disruption, or; 2) decreasing trends or sub-optimum water quality suggest future impacts, or; 3) support of a specific/distinctive use make the waterbody more susceptible to water quality threats.</p>							
<p>³ Dissolved Oxygen criteria apply to streams, unstratified lakes and the epilimnion of stratified lakes. For the hypolimnion of lakes, there is to be no reduction of dissolved oxygen from other than natural conditions.</p>							

Fish Consumption Use

Support of *Fish Consumption* use is primarily based on New York State Department of Health (NYSDOH) advisories regarding the catching and eating of sportfish. Contaminant monitoring in fish tissue, other biological tissue and surficial bottom sediments, as well as the suspected presence of other contaminants (algal biotoxins) may also be taken into consideration. The NYSDEC Division of Fish Wildlife and Marine Resources (DFWMR) monitors contaminant levels in fish in selected waterbodies. Based on the results of this monitoring, NYSDOH issues advisories for specific waterbodies and species when contaminant levels in sportfish exceed established standards. The assessments contained in the WI/PWL and reflected in the Section 303(d) List of Impaired/TMDL Waters are updated infrequently and are not a substitute for the NYSDOH-issued advisories. These advisories are updated and published annually; the current list of advisories is available at www.health.ny.gov/fish. Evaluation of fish consumption use is appropriate for all waterbodies, regardless of classification. However NYSDOH fish consumption advisories are more likely to be issued for waterbodies that support sportfishing. The relationship between the NYSDOH advisories and fish consumption use support is reflected in Table 7.

References to advisories in Table 7 are assumed to mean waterbody-specific advisories, unless otherwise stated. In addition to the waterbody-specific advisories, a general advisory recommends eating no more than one meal (one-half pound) per week of fish taken from all New York State freshwaters. This general statewide advisory is to protect against eating large amounts of fish that have not been tested or that may contain unidentified contaminants. Because the general statewide advisory is precautionary and not necessarily based on any actual contaminant monitoring data, it does not represent any documented impact or impairment to *Fish Consumption* use. Consequently, the general statewide advisory is not interpreted as a restriction to *Fish Consumption* use.

NYSDOH has determined that both waters that have been tested and found to have no significant contaminants, as well as waters that have not been tested at all, are subject to the precautionary statewide general advisory allowing the consumption of up to one meal per week. Because this advisory represents the highest possible level of fish consumption use, waters subject only to the general advisory may be evaluated as being *Fully Supporting* of this use. However the evaluation of fish consumption use in such waters as *Fully Supported* will also be noted as *Unconfirmed* if no fish contaminant sampling has been conducted. The evaluation of fish consumption as *Fully Supported* but *Unconfirmed* should be limited to waters where other uses have been evaluated and those evaluations do not indicate a potential for contamination.

Specific advisories for many marine waters recommend limiting the consumption of striped bass, bluefish, weakfish and eels. Ocean fish, although tested less often, are generally less contaminated than freshwater fish. However these species have specific habits or characteristics – specifically a wide migratory range, predatory nature and high lipid/fat content – that make them more likely to accumulate contaminants. Because possible contamination is more a result of the migratory range and other factors, rather than any known sources of contaminants in these waterbodies, these advisories are also considered to be precautionary. In addition, for most of these species the advisories recommend limiting consumption to no more than one meal per week, which is no more stringent than the general statewide advisory for all New York waters. As a result these marine water advisories are not considered to result in impairment to fish consumption use and waters where such advisories occur are typically assessed as having *Stressed* fish consumption use.

Waterbody-specific advisories apply to tributaries and connected waters where there are no dams, falls or impassable barriers to prevent fish from moving upstream. However because this is due to the migratory range of the fish and not necessarily a reflection of any contamination in the tributary waters, these connected waters are not evaluated as having impaired fish consumption use, but the use may be evaluated as *Stressed*.

The NYSDOH advisories also include more restrictive recommendations for women under 50 years of age and children under 15 year of age. These restrictions are appropriate to protect young and unborn children who have a greater susceptibility to some contaminants. Advisories for these sub-populations are not incorporated into the assessment of fish consumption use. However as noted previously, the public is encouraged to refer to the NYSDOH-issued advisories for the most specific advice regarding the safe consumption for fish.

For waterbodies where there is no current advisory in place, but where chemical monitoring of fish, persistent algal toxins, or biological tissue or sediment sampling suggests it may be appropriate to restrict consumption of fish from certain waters, such information is forwarded to DFWMR and NYSDOH for review and determination if an advisory beyond the statewide advisory is appropriate. Until such a determination is made, fish consumption use in these waters may be evaluated as *Stressed*. Uses in such waters are not considered *Impaired* unless and until an advisory is issued by NYSDOH. This maintains consistency between the Section 303(d) List and the NYSDOH fish consumption advisory listings.

Table 7 Fish Consumption Use Evaluation Criteria	
Use Evaluation Criteria	Severity
Conditions Frequently Prevent Use <ul style="list-style-type: none"> • NYSDOH advisory recommends eating no fish. 	Precluded
Conditions Occasionally Prevent or Frequently Discourage Use <ul style="list-style-type: none"> • NYSDOH advisory recommends eating no fish of a specific species, or • NYSDOH advisory recommends limiting consumption of one or more fish species (no more than one meal per month). 	Impaired
Conditions Occasionally Discourage Use <ul style="list-style-type: none"> • NYSDOH advisory recommends limiting consumption of one or more fish species (no more than one meal per week) from certain marine waters, or • Monitoring of fish/biological tissue or surficial bottom sediment shows contaminant (Hg, PCB) levels that exceed levels of concern, but a NYSDOH advisory has not been issued, or • Occurrence of harmful algal blooms at frequency indicating persistence of biotoxins, or • Waters are connected to, and fish may migrate from, other waters where a NYSDOH waterbody-specific advisory is in place,¹ or • Fish consumption advisory issued by a neighboring state is in place for a shared waterbody. 	Stressed
Conditions Fully Support Use <ul style="list-style-type: none"> • No fish consumption advisory beyond NYSDOH <i>General Advisory for Eating Sportfish</i>, and • No fish/biological tissue or surficial bottom sediment showing contaminant (Hg, PCB) levels above background levels, and • No other sources or potential for contamination is evident. 	Fully Supported ²
Conditions Support Use, but Specific Threats Noted <ul style="list-style-type: none"> • No specific use evaluation criteria; see definition of <i>Threatened</i>.³ 	Threatened
<p>¹ It may not be practical or desirable to assign a <i>stressed</i> assessment to all such waters. This criterion is included here to clarify that fish consumption use in such waters should be assessed as <i>stressed</i> rather than <i>impaired</i>.</p> <p>² The absence of a waterbody-specific advisory may be interpreted as indicating fish consumption use is <i>Fully Supported</i>, but this should be noted as <i>Unconfirmed</i> if no contaminant sampling has been conducted.</p> <p>³ <i>Threatened</i> waters include those waters where uses are <i>Fully Supported</i>, however: 1) changing land use patterns may result in restricted use or ecosystem disruption, or; 2) decreasing trends or sub-optimum water quality suggest future impacts, or; 3) support of a specific/distinctive use make the waterbody more susceptible to water quality threats.</p>	

Habitat/Hydrologic and Aesthetic Conditions

Separate from the evaluation of designated uses previously discussed, waterbody assessments also include evaluations of both the habitat/hydrology and the aesthetic conditions of the waterbody. Though not actual waterbody uses, these conditions help to inform and explain impacts to uses and may be taken into account when determining an overall waterbody assessment. In the case of habitat/hydrology, these additional evaluations often provide context to situations where the impacts to waterbody uses – particularly aquatic life – are due to the physical characteristics, natural biological diversity, or flow regime of the stream or lake, rather than the result of contaminants that affect water quality. A separate evaluation of aesthetics allows a more appropriate means to include more subjective conditions – such as weeds, water color, or trash/litter – that can have an impact on recreational and other uses.

Because *Habitat/Hydrology* and *Aesthetics* are not actual uses, these conditions are not categorized as being *Precluded*, *Impaired*, *Stressed*, *Threatened* or *Fully Supported*. Rather the Habitat/Hydrology and Aesthetic conditions of waterbodies are evaluated as *Good*, *Fair*, *Poor* or *Unassessed*, depending upon the degree to which these conditions influence use support. Specifically:

- *Good* conditions indicate habitat/hydrology and aesthetics do not influence use support,
- *Fair* conditions indicate habitat/hydrology and aesthetics have some influence on use support,
- *Poor* conditions indicate habitat/hydrology and aesthetics are a determining factor for use support, and
- *Unknown* indicates no evaluation of habitat/hydrology and aesthetics has been conducted.

Habitat/Hydrology Condition

The evaluation of the *Habitat/Hydrology* condition of a waterbody is helpful in instances where water quality is appropriate to fully support uses, but other conditions – such as poor or altered habitat, low streamflow/water level, invasive or nuisance species – result in impacts to uses. Federal (USEPA) guidance regarding water quality assessments recognizes a distinction between impacts and impairments that are caused by pollutants (i.e., substances/contaminants in a waterbody whose loadings can be reduced) and those that are the result of pollution (i.e. conditions that are characteristic, perhaps naturally occurring, of the waterbody). NYSDEC uses the evaluation of the *Habitat/Hydrology* condition to identify and segregate water quality-caused impacts from conditions that are related to habitat and/or hydrology.

The separate evaluation of *Habitat/Hydrology* is not intended to minimize the impacts caused by such conditions. However the most effective means to address such problems is very often different than the approaches taken to address water quality problems caused by chemical contaminants (e.g., TMDLs, or other loading reduction strategies). Criteria for the evaluation of habitat and hydrology conditions are reflected in Table 8. These criteria are more often related to the cause or source of the problem, than by the use affected. Such causes/sources include:

- stream widening or downcutting;
- sediment embeddedness;
- loss of riparian vegetation or upland buffer zones;
- restricted access for fish passage;
- habitat fragmentation;
- dredging, draining, excavation and/or filling of wetlands, stream channels, lakes/ponds;
- other losses of wetlands; and
- reduced or significantly fluctuating streamflow or lake levels due to water withdrawals, diversions, discharges of reservoir releases.

Table 8 Habitat/Hydrology Condition	
Evaluation Criteria	Condition
<p>Conditions are a Determining Factor in Some Use Support Evaluations</p> <ul style="list-style-type: none"> • Habitat conditions¹ that result in moderate or severe biological impact. • Reduced streamflow or impoundment effects that result in moderate or severe biological or recreational impact. • Low flow or other barriers that restrict passage of fish species • Excessive invasive/exotic plant growth² resulting in impacts requiring active management (e.g. mechanical weed harvesting) to maintain recreational use. 	Poor
<p>Conditions have Some Influence on Use Support Evaluations</p> <ul style="list-style-type: none"> • Habitat conditions¹ that result in slight biological impact. • Invasive or exotic plant growth² that is well established that requires active management (e.g. mechanical harvesting) to enhance recreation use. 	Fair
<p>Conditions Do Not Influence Use Support Evaluations</p> <ul style="list-style-type: none"> • No biological impacts that are the result of habitat/hydrology conditions, and • No indications of restricted passage that limit fish propagation, and • No recreational impacts from invasive and/or exotic plants. 	Good
<p>* Parameter-Specific Condition Evaluation Criteria</p> <p>Habitat Model Affinity < 70</p>	
<p>¹ Typically determined using Habitat Model Affinity (See <i>Parameter-Specific Condition Evaluation Criteria</i>, above), or other measures/observations of habitat or hydrologic impacts to biological community.</p> <p>² Invasive/Exotic plant growth is reflected in the Habitat/Hydrology condition. Excessive native plant growth is more typically captured in the Aesthetic condition.</p>	

Aesthetic Condition

The evaluation of the *Aesthetic* condition of a waterbody is more subjective than the evaluation of specific designated uses. It is likely that any waterbody with aesthetic conditions that are *Fair* or *Poor* will also have designated uses that will be *Stressed*, *Impaired* or *Precluded*. It is more appropriate that the evaluation of the support of those uses drives the overall waterbody assessment, and that the aesthetic condition of a waterbody remain an ancillary component of the overall waterbody assessment.

NYSDEC has attempted to quantify aesthetic condition through the use of a user perception survey within its Citizen Statewide Lake Assessment Program (CSLAP) volunteer monitoring program. The CSLAP user perception survey asks trained sampling volunteers to assess the water quality conditions, aquatic plant coverage, and recreational suitability of the lake on a 5 point scale, from most favorable conditions (or least extensive plant coverage), to least favorable conditions (or most extensive plant coverage). This survey form is completed at the same time that water samples are collected, to allow perception data to be explicitly linked to water sampling results. The survey forms also ask samplers to identify factors that influence lake recreational perception, such as poor water clarity, excessive algae or weeds, and excessive boat traffic, and other factors that might affect the health and safety of lake users, such as swimmers itch, shoreline algae blooms, or fish kills.

The criteria for the evaluation of aesthetic conditions are reflected in Table 9.

Table 9 Aesthetic Condition	
Evaluation Criteria	Condition
Conditions Occasionally Discourage Use <ul style="list-style-type: none"> • Observational Criteria Data¹ indicates significant impacts to recreational use. • Excessive native/nuisance plant growth results in impacts requiring active management (e.g. mechanical weed harvesting) to maintain recreational use. • Monitoring data show exceedence of one or more parameter-specific use evaluation criteria.* 	Poor
Conditions Occasionally Discourage Use <ul style="list-style-type: none"> • Observational Criteria Data¹ indicates lesser impacts to recreational use. • Additional measures to reduce native/nuisance plant growth² are in place in order to improve/enhance recreational use. 	Fair
Conditions Fully Support Use <ul style="list-style-type: none"> • No concerns identified through Observational Criteria Data, and • No significant occurrence of HABs have been reported, and • Additional measures are not in place, and • Monitoring data does not exceed use evaluation criteria. 	Good
* Parameter-Specific Condition Evaluation Criteria	
Phosphorus, Total (mean) ³	20 ug/l
Phenolic Compounds ⁴	1 ug/l
¹ <i>Observational Criteria Data</i> refers to results from CSLAP user perception surveys or other similar established surveys of waterbody condition and use support. ² Native plant growth that is excessive is reflected in the Aesthetic condition; Invasive/Exotic plant growth is more appropriate to capture in the Habitat/Hydrology condition. ³ Limited to Poned Waters. ⁴ Applies to Class A, AA waters suitable for use as a water supply.	

Waterbody Assessment

Once the levels of support of individual uses have been evaluated for a waterbody, then an overall waterbody assessment can be conducted. The waterbody assessment incorporates the evaluation of all uses, but typically reflects the most significantly impacted or impaired of all uses. The WI/PWL waterbody assessment also takes into account the level of confidence assigned to the evaluations of use support. These assessments also identify pollutant and source information, recommendations for water resource management actions (i.e., appropriate “next steps” for restoration and/or protection of water quality), and a more detailed narrative description of conditions and actions.

Waterbody Assessment Categories

Based on the severity of the most significant impacts/impairments to uses and the confidence in that evaluation of use support, all waterbodies are assigned to one of six *Waterbody Assessment Categories*. Although these Waterbody Assessment Categories are often interpreted as a hierarchy of the seriousness of the water quality impacts, they are intended to indicate the status of the assessment that has been conducted to date, and to identify the appropriate next steps for the management of the waterbody.

Waterbody Assessment Categories
<i>Impaired Waters</i>
Waters with <i>Minor Impacts</i>
<i>Threatened Waters</i>
Waters Impacts <i>Need Verification</i>
Waters with <i>No Know Impacts</i>
<i>Unassessed Waters</i>

Table 10
Relationships Between Evaluation of Waterbody Use Impacts and Resulting WI/PWL Waterbody Assessment Categories

Severity of Use Impact	Level of Confidence in Evaluation of Use Impact		
	Known	Suspected	Unconfirmed
Precluded	Impaired Water ²	N/A ¹	N/A ¹
Impaired		Minor Impacts ³	Needs Verification (of Impairment ⁴)
Stressed	Minor Impacts (but Supporting Uses)	Minor Impacts (but Supporting Uses)	Needs Verification (of Any Impacts)
Threatened	Threatened, (but Fully Supporting Uses)	No Known Impacts ⁵ (Fully Supporting Uses)	N/A ⁶
Fully Supporting	No Known Impacts (Fully Supporting Uses)		UnAssessed ⁷
Unassessed	Unassessed Water		

¹ A greater level of confidence in the evaluation is required to designate a use as *Precluded*.

² Waterbodies included on Section 303(d) List or USEPA Integrated Reporting (IR) Category 4, as appropriate.

³ These waterbodies may be included on the Section 303(d) List or IR Category 4, although questions remain whether impacts in these waterbodies rise to the level of an impairment and might be more appropriately assigned to IR Category 3 as having “insufficient data to make a listing determination.”

⁴ Waterbodies identified as Needing Verification of *impairment* are assumed to have uses that are *Stressed*; the needed verification is to determine whether the impacts/stresses rise to the level of an impairment of uses.

⁵ Absent a clearly identified threat or documented declining water quality trend, waterbodies thought (i.e., suspected) to be *Threatened* are considered to have No Known Impacts,

⁶ *Unconfirmed Threatened* uses are not tracked by the WI/PWL assessment program.

⁷ Uses previously evaluated as *Fully Supporting* but which have not been re-evaluated in more than 10 years may be characterized as *Fully Supporting*, but *Unconfirmed*.

Impaired Waters are waterbodies with well documented water quality problems that require restoration measures in order for uses to be supported. These waters are candidates for inclusion on the NYS Section 303(d) List of Impaired/TMDL Waters (see also [Listing Methodology](#), separate document). Impaired Waters have *Precluded* or *Impaired* uses, where the confidence in that assessment is *Known*. Waters with *Stressed* or *Threatened* uses are not included in this category.

Waters with Minor Impacts are waterbodies where lesser water quality impacts are apparent, but where uses are still considered to be supported. Although water quality improvement is desired, protection – rather than restoration – strategies may be more appropriate for these waters. Generally these waters correspond to waters evaluated as having *Stressed* uses that are either *Known* or *Suspected*. Waters with uses that are *Suspected* of being *Impaired* are also considered to be have *Minor Impacts* until the suspected impairment can be confirmed.

Threatened Waters are waterbodies for which uses are not restricted and no water quality problems currently exist, but where additional efforts to protect waters from potential future impacts would be appropriate, based on declining water quality trends, specific land use in the surrounding watershed, and/or the support of specific uses makes the waterbody more susceptible to water quality threats (e.g., Class AA waters). Targeted, waterbody-specific protection strategies are appropriate for these waters. These waters have uses that are *Known* to be *Threatened*. Waters with *Suspected* Threats are considered to have *No Known Impacts*.

Waters with Impacts that Need Verification are waterbodies that are thought to have water quality impact or impairment, but for which there is insufficient documentation to justify additional management actions. Such waterbodies require additional monitoring to determine whether uses are, in fact, impacted or impaired. These segments include waters with uses that are evaluated as being *Stressed* or *Impaired*, but where that evaluation remains *Unconfirmed*.

Waters with No Known Impacts are waterbodies where monitoring data and information indicate that there are no use restrictions or other water quality impacts to uses. These waters correspond to waters where uses have been evaluated as being *Fully Supported*. Waters with *No Known Impact* also include waters with *Threatened* uses that have not been fully documented (ie, *Suspected*). This category is appropriate to use even when some, but not all, waterbody uses have been assessed.

UnAssessed Waters are waterbodies where adequate water quality information is not available to evaluate the support of any designated uses.

The WI/PWL Waterbody Assessment Categories differ somewhat from the national Use Attainment Categories suggested by USEPA in their Integrated Reporting (IR) guidance for reporting on water quality. Whereas the IR Use Attainment Categories are more narrowly focused on the attainment of water quality standards and the appropriateness of TMDLs to address water quality impairments, the Waterbody Assessment categories used in the WI/PWL are crafted to better provide support multiple NYSDEC water quality management programs.

Perhaps the most significant difference between the two frameworks involves the inclusion of waters with *Minor Impacts* as a WI/PWL category. This category allows for the tracking of waters that meet water quality standards and support uses, but that have less than optimal water quality. This is a broad category that ranges from waters where conditions are considered stable and additional activities are not necessary to maintain use support into the future, to waters that are approaching an impairment of one or more uses. These waters are candidates for protection strategies to prevent further degradation of water quality.

Although tracking waters with *Minor Impacts* is not readily accommodated within the USEPA national IR use attainment categories, this category supports NYSDEC water quality management programs and is an integral component of its overall watershed restoration and protection efforts. Emphasis at the federal government level regarding water quality efforts continues to be focused on the restoration of waters that do not support uses (*Precluded, Impaired*). However, at both the state and local levels, there is growing interest in and support for directing resources to protection efforts as well. Maintaining non-impacted waters and improving waters with lesser impacts is often a more effective use of limited resources for the advancing of water quality goals and progress. The more comprehensive framework of the Waterbody Assessment Categories used in the WI/PWL better supports efforts to benefit these waters.

The tracking of waters with minor impacts – while not readily accommodated in the national Use Attainment Category scheme – supports the NYSDEC water quality management programs and is an integral component of its overall watershed restoration and protection efforts.

Although the current national IR use attainment categories differ from the WI/PWL Waterbody Assessment Categories, the two schemes share significant similarities. As a result waters assigned to WI/PWL Assessment Categories translate easily to corresponding USEPA designations. A more detailed discussion of the linkage between the WI/PWL Waterbody Assessment Categories and the IR categories is presented in the [Listing Methodology](#).

Monitored and Evaluated Waters

In compiling water quality information for 305(b) reporting, states have in the past been required to distinguish between water quality assessments based on monitoring data, and assessments based on other information. Distinctions between *Monitored* and *Evaluated* waters in New York State depend on both the type of information used to evaluate uses and the age of the information. These distinctions are outlined below.

Monitored Waters are those waterbodies for which the assessment of at least one use is based on ambient site-specific monitoring data that can be compared to established water quality standards or criteria or surrogate water quality indicators. Furthermore, this data should have been collected within one or two five-year rotating basin cycles. Such data typically includes biological monitoring and/or chemical/physical monitoring results. Because fixed-station chemical/physical monitoring represents only a “snapshot” in time, such monitoring might need to be conducted more frequently if it is to accurately portray water quality conditions at the site.

Evaluated Waters are those waterbodies for which the use support assessment is based on information other than current site-specific ambient monitoring data. Such assessments may rely on:

- administrative use orders,
- consideration of land use data,
- identification of sources and/or predictive modeling,
- assessments of nearby waters in the same watershed,
- monitoring results for sites just upstream or downstream of the segment, and/or,
- ambient monitoring data that is more than 10 years old.

Regarding assessments based on administrative use restrictions, such waters are typically considered to be *evaluated* because, although such restrictions are based on monitoring data, the data is not used directly but rather filtered through an evaluation conducted by another agency/program. Consequently, a full understanding of the data, such as how recently it was collected and the frequency of sampling, is not readily available for consideration.

Pollutants (Causes) and Sources of Impacts/Impairments

In addition to providing assessments of designated use support, the WI/PWL assessments also include an evaluation of the pollutants/causes and sources that are responsible for water use impacts. Listings of the pollutants and sources used in these evaluations are presented in Table 11 and Table 12, respectively.

These pollutant and source identifications are derived from available of information including water chemistry data, biological *Impact Source Determinations* (ISD), source assessments or other available information. However in most cases the available monitoring data is the result of efforts aimed at characterizing the water quality, rather than the trackdown of pollutants and sources. Consequently, the identification of pollutants and sources reflected in the WI/PWL assessments should be considered to be driven primarily by best professional judgment based on surrounding land use and other anecdotal knowledge of the waterbody. Specific pollutants and sources should be verified with additional study before remedial actions are taken.

Table 11
Pollutants (Causes) Contributing to Impact/Impairment

Chemical Pollutants Nutrients (Phosphorus, Nitrogen) ¹ Ammonia Chlorine Unknown Toxicity ² Metals Acid/Base (pH, ANC ³) Chloride/Salts Pesticides Priority Organics Oil and Grease ⁴	Biological Pollutants Pathogens Harmful Algal Blooms ⁵ Algal/Plant Growth, native ⁶ Aquatic Invasive Species ⁷
	Physical Pollutants Oxygen Demand/Low D.O. ⁸ Silt/Sediment ⁹ Thermal Changes ¹⁰ Water Level/Flow ¹¹ Restricted Passage ¹²
	Other Pollutants Other Pollutant ¹³ Unknown Pollutants ¹⁴

¹ *Nutrients* determined by chemical monitoring or biological metrics

² *Unknown Toxicity* determined by toxicity testing, assays, or recurring fishkills.

³ Acid Neutralizing Capacity

⁴ *Oil and Grease* determined by visual observation against the narrative water quality standard for oil and floating substances (no visible film/sheen, no globules of grease).

⁵ *Harmful Algal Blooms* as determined by visual observation, or other HABs criteria. Presence of HABs results in impacts to Recreation and Public Bathing uses.

⁶ *Algal/Plant Growth* determined by visual observation. Recognize that some algal/plant growth is natural; excessive algal/plant growth pollutant is typically reflected in the evaluation of the waterbody *Aesthetic* condition, unless such growth causes impact/impairment to recreational use. Plant growth as captured here refers to native plants (see also *Invasive Aquatic Species*).

⁷ *Aquatic Invasive Species* as captured here refers to non-native invasive and/or exotic plants or animals (see also *Algal/Plant Growth*). This pollutant is typically reflected in the evaluation of the waterbody *Habitat/Hydrology* condition.

⁸ Regarding *Oxygen Demand/Low Dissolved Oxygen (D.O.)* the diurnal fluctuation and stratification of D.O. in ambient waters hinders the use of single sample measurements in making assessments. Determination of low D.O. typically relies on continuous monitoring over a longer period, modeling evaluations, or biological indicators associated with low D.O. conditions.

⁹ *Silt/Sediment* reflects both suspended sediment and turbidity that affects water clarity, and depositional sediments loading that affects aquatic habitat/ passage or recreation use. Silt/Sediment is determined by TSS/TDS/turbidity measurement, as well as observation of deposition.

¹⁰ Regarding *Thermal Changes*, the diurnal and seasonal fluctuation and stratification of temperature in ambient waters hinders the use of single sample measurements in assessments. Determination of thermal changes typically relies on continuous monitoring over a longer period, modeling evaluations, or biological indicators associated with thermal changes.

¹¹ *Water Level/Flow* refers to high, low or fluctuating conditions that affect aquatic life or recreational use. This pollutant is typically reflected in the evaluation of the waterbody *Habitat/Hydrology* condition.

¹² *Restricted Passage* refers to physical barriers that are generally independent of flow/water level. This pollutant may be typically reflected in the evaluation of the waterbody *Habitat/Hydrology* condition.

¹³ *Other Pollutant* includes any Known, Suspected or Unconfirmed pollutant that does not fall in any other category. This category includes pollutants previously categorized as *Non-Priority Organics* and *Other Inorganics*.

¹⁴ *Unknown Pollutants* includes all currently unidentified causes of water quality impact. All *Unknown Pollutants* should be characterized as Unconfirmed. *Unknown Pollutants* may include the note *Biological Impact* when biological sampling indicates an impact but is unable to identify a specific pollutant.

The indication of pollutants and sources in the WIPWL assessments includes an evaluation of the degree to which they are thought to contribute to water quality problems. Specifically, all identified pollutants and

sources are characterized as being *Known*, *Suspected*, or *Unconfirmed*. Typically *Known* is used to identify pollutants or sources where direct measurement or observation confirms the pollutant/source contribution to the impact/impairment. *Suspected* identifies pollutants/sources where the contribution is inferred and/or likely but direct measurement/observation is lacking.⁹ Pollutants/sources that are present but it is uncertain whether they are contributing to the impact/impairment are identified as *Unconfirmed*.

In addition to characterizing multiple pollutants and sources that contribute to water quality impacts or impairment as *Known*, *Suspected*, or *Unconfirmed*, pollutants and sources that are known or suspected of contributing to an *Impaired Waterbody* assessment are also specified. This designation – sometimes (previously) referred to as a “major” pollutant/source – is used to track waterbody/pollutants for Section 303(d) Listing purposes. For pollutants that contribute to an impaired waterbody designation, the corresponding Section 303(d) List Part number (for Listed waterbody/pollutants) or IR Category 4 designation (for impaired waterbodies that are not Listed) is also indicated. A notation capturing all the sources of these pollutants, and the year in which the waterbody pollutant was added to the 303(d) List (or to IR Category 4) is also tracked for these contributing pollutants.

Table 12	
Sources of Impact/Impairment	
Point Sources Industrial Discharges Municipal Discharges Private/Commercial/Institutional Discharges Power Generation Discharges Combined Sewer Overflow (CSOs) Other/Non-Permitted Sanitary Discharge	Legacy Sources Atmosph. Deposition Toxic/Contaminated Sediment Chemical Leak/Spill Landfill/Land Disposal
	Physical/Other Alteration Habitat Alteration Hydrologic Alteration Streambank Erosion Roadbank Erosion
Nonpoint Sources Agriculture Urban/Storm Runoff OnSite Wastewater Treatment/Septic Systems Silviculture Construction	Other Sources Resource Extraction (mining, drilling) Deicing Activities (storage/application) Other Source Unknown Source

National (USEPA) reporting guidance suggests that state assessments go even further and specify which uses are affected by which pollutants, and which sources contribute each pollutant. However as noted previously, the New York Statewide Water Monitoring Program does not routinely focus on pollutant identification and source trackdown to the degree that the relationship between impact, pollutant and source is known with certainty. Pollution identification and source trackdown are more resource-intensive efforts reserved for special priority situations. New York State data regarding the links between sources, pollutants and use impacts should be broadly interpreted and understood to reflect that most sources contribute varying degrees of multiple pollutants and each pollutant has some influence on all impacted uses.

⁹ Pollutants and sources identified through Biomonitoring Impact Source Determination (ISD) results should be identified as *Suspected*, unless additional data/information exists to verify their contribution.

Management Information

The WI/PWL Waterbody Assessments also allows for the tracking of information relating to management and ultimate resolution of water quality impacts for each waterbody. This management resolution information helps to identify and prioritize subsequent actions across a wide range of NYSDEC and other agency programs focused on the restoration and protection of these water resources. The specific management actions assigned to waterbodies align along a path that leads from initial assessment, to problem identification, strategy development and implementation, and – ultimately – resolution. The management action categories are outlined below.

Unassessed – waters that have not been assessed or have not been assessed recently enough to provide a current assessment.

Assessment/Reassessment Scheduled – Waters that have been identified for upcoming (scheduled) sampling that will result in an updated assessment.

Verification of Problem Severity Needed – Waters requiring additional study or sampling (to evaluate severity of WQ problem) needed in order to determine next steps.

Verification of Pollutants/Causes Needed – Waters requiring additional study or sampling (to evaluate pollutants causing WQ problem) needed in order to determine next steps.

Verification of Sources Needed – Waters requiring additional study or sampling (to evaluate sources contributing to WQ problem) needed to determine next steps.

Strategy Development Needed or Underway – Waters where issues have been defined, an appropriate restoration (or protection) strategy has not been developed.

Funding for Strategy Implementation Needed – Waters where a management strategy has been developed, but necessary funding had not yet been identified.

Strategy Implementation Scheduled or Underway – Waters where specific management strategies have been identified, funded, and are being implemented.

Reassessment Needed – Waters where reassessment to measure the results of activities associated with implementation of a strategy is needed; does not refer to routine (periodic) reassessment.

No Action Needed – Waters with no known impacts or minor impacts/threats that are being addressed through broad-based (as opposed to waterbody-specific) activities.

Such information allows NYSDEC to better:

- prioritize monitoring, restoration and protection activities,
- target the expenditure of limited resources to those waters where there is greatest public interest and/or the expectation that measurable improvements can be achieved, and
- track progress toward water quality improvement and problem resolution.

Management Information also includes the designation of the Lead Agency/Office that is considered to be most appropriate to follow up on whatever next steps are identified as management actions. And lastly, Management Information includes the Section 305(b) Integrated Reporting (IR) Category to which the waterbody has been assigned, based on the assessment information. The IR categories (and subcategories) are outlined below.

Waters Attaining All Standards (IR Category 1) describes waters where data and information indicates standards are met and all appropriate uses are supported, and no standards or uses are threatened.

Waters Attaining Some Standards (IR Category 2) describes waters where data and information indicates standards are met and appropriate uses are supported (and none are threatened), but where compliance with some standards and support of some uses have not been fully assessed due to insufficient data/information.

Waters with Insufficient Data (IR Category 3) describes waters where insufficient or no data is available to make a determination of standards attainment and use support.

Impaired/Threatened Waters Not Requiring a TMDL (IR Category 4) describes waters where standards are not being met and/or uses are not supported, but where TMDL development is not necessary because:

- a TMDL to address the impairment has been completed (Category 4a), or
- other actions required by federal, state and/or local agencies are more appropriate than a TMDL and are expected to result in water quality improvement (Category 4b), or
- the impairment/threat is attributed to pollution (such as flow alteration, hydrologic modification, degraded habitat, exotic, invasive and/or non-native species, or other cause not associated with a contaminant), rather than a specific pollutant, that is suitable to address through development of a TMDL (Category 4c).

Impaired/Threatened Waters Requiring a TMDL (IR Category 5) describes waters where standards are not being met and/or uses are not supported, and where TMDL development may be an appropriate means to address the impairment/threat. These waters are included on the current New York State Section 303(d) List.

Impaired/Threatened Waters Requiring a TMDL (IR Category 5) – PROPOSED describes waters where the most recent assessment indicates that standards are not being met and/or uses are not supported, and where TMDL development may be an appropriate means to address the impairment/threat. These waters are NOT included on the current New York State Section 303(d) List, but are proposed to be added to the List during the next listing cycle.

Further Details

Each individual waterbody assessment in the WI/PWL also includes a narrative discussion to capture pertinent details about the waterbody, water quality conditions and current or proposed management actions; all of which guide program managers in determining next steps in the protection and/or restoration of the waterbody. The narrative discussion is segmented into specific areas, each of which is described below.

Overview – This brief narrative conveys (in one paragraph) the basic status of the waterbody. Specifically it notes which, if any, uses are impacted, the degree of impact, and the pollutants and sources causing and contributing to the impacts. It might include mention of other aspects of the waterbody of assessment that are of particular note.

Use Assessment – This narrative provides additional detail about the evaluation of support of each use. The discussion typically begins with the identification of the waterbody classification, and the uses for which the waterbody is assessed. The level of impact/impairment to each use, the likely pollutants causing the impact/impairment, and the level of confidence in the use evaluation are addressed in this narrative. (Note: Sources are discussed in a separate narrative.) Uses that are fully supported are also noted in the discussion, as are uses that were unassessed.

Water Quality Information – This narrative outlines the most recent and pertinent sampling data

and/or other water quality information that was used in the evaluations of use support and assessment of the waterbody. In addition to DEC/DOW sampling efforts, sampling conducted by other DEC programs or other agencies or organizations can be included. The quality of the data from other sources may influence the level of confidence associated with the corresponding use assessment. (i.e., resulting use evaluations might be noted as “suspected” or “possible”).

Source Assessment – This narrative discusses what is thought to be causing the identified water quality problems in the waterbody. The level of confidence in the knowledge of the pollutants, causes and sources of impacts will vary, and should be appropriately reflected in the narrative. Often the identification of contributing factors will rely largely on professional judgment based on knowledge of the waterbody and surrounding watershed. Regional staff more familiar with a waterbody may be particularly helpful with the source assessments.

Management Actions – This narrative describes efforts currently underway or proposed to address the identified water quality problems in the waterbody. The narrative should identify the lead agency (also reflected in the database) and likely next steps. Any hurdles to the implementation of management actions should also be noted. Regional staff may be particularly helpful in determining appropriate management actions..

Section 303(d) Listing – This narrative notes whether or not the waterbody is included on the Section 303(d) List of Impaired/TMDL Waters. This information should include some history of the waterbody’s Section 303(d) status (i.e., when it was added, deleted). Any recommendations for future listing or delisting based upon the updated assessment should also be included.

Segment Description – This narrative describes in detail the boundaries of the waterbody segment being assessed. The description will also include what waterbody classification(s) apply within the waterbody, as some segments included waters of different classes and many segments include non-trout, trout (T), and trout spawning (TS) waters within the same segment. Because segment boundaries and waterbody classifications do not frequently change, the Segment Description remains fairly constant.

In order to capture how conditions in a waterbody have changed over time, updated narratives should be written in a manner that preserves some of the previous information about the waterbody. Specifically if updated assessment indicate conditions have changed, some of the previous – but now outdated – narrative might be retained, but edited to read “Previous assessments found that...” In this way the narratives provide a waterbody history that can be used to identify successful restoration actions as well as waterbodies where conditions are worsening.

Each paragraph in the narrative (except for the Overview, which is a compilation of other narrative information) should also include a reference/citation that indicates the source and date of the information. Typical format is: (DEC/DOW, BWAM, January 2013) or (DEC/DER, Region 5, January 2013) or (NYCDEP, NY Harbor Survey, 2013)