# Water Quality Standards and Guidance Values

NYS’s water quality standards (WQSs) and guidance values (GVs) are defined in [Title 6 NYCRR, Part 703](https://govt.westlaw.com/nycrr/Browse/Home/NewYork/NewYorkCodesRulesandRegulations?guid=I070d30d0b5a111dda0a4e17826ebc834&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default)), and [TOGS 1.1.1](https://www.dec.ny.gov/docs/water_pdf/togs111.pdf), respectively. WQSs and GVs are assigned to fresh and saline surface water classes, and ultimately determine if a waterbody is attaining it’s designated uses (i.e., fishin, secondary contact recreation, primary contact recreation, source water supply, and shellfishing). In general, the relationship between waterbody classes is hierarchical.

## Waterbody Class Hierarchy

Fresh and saline surface water classes generally conform to a descending alphabetical hierarchy (Figure 3). Class D represents the most upstream class of the fresh surface waters, while class AA-Special represents the most downstream class (Figure 3A). Similarly, class SD represents the most upstream class of the saline surface waters, while class SA represents the most downstream class (Figure 3B). Class I, within saline surface waters, is downstream of class SC and upstream of class SB; therefore, class I creates a descrepancy in the descending alpahebtical hierarchy of saline surface water classes.

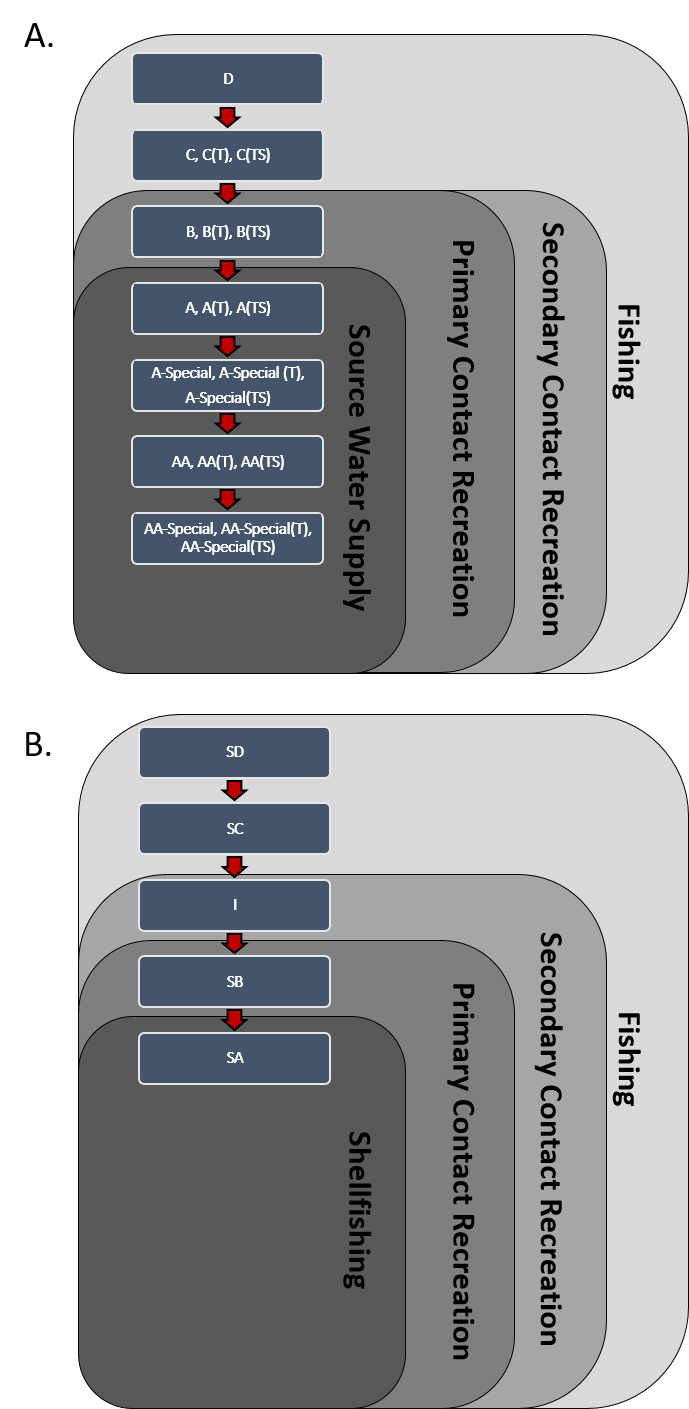


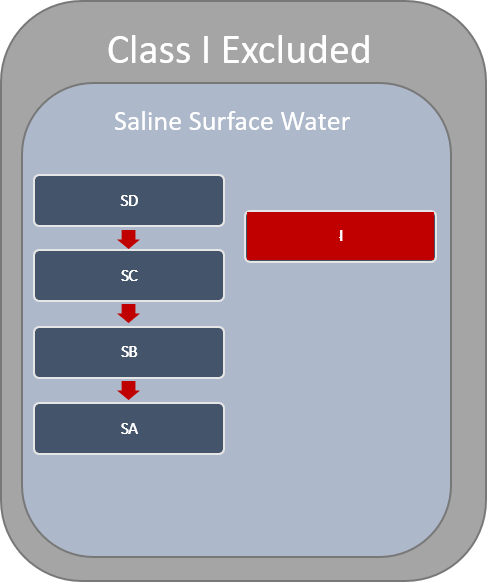
Figure 3: The standard waterbody class hierarchy of fresh (A) and saline surface waters (B) for which New York State’s water quality standards are inherited in descending alphabetical order. The navy blue boxes represent the waterbody classes and the red arrows indicate the direction that water quality standards are inherited through the class hierarchy. The gray boxes surrounding the depiction of class hierarchy indicate which designated uses are applicable for a given class.

WQSs and GVs assigned to upstream classes are inherited by all downstream classes. The most upstream class associated with a WQS or GV will be referred to as the “root” class for a given standard. For example, fishing use WQSs and GVs have a root of D and SD classes, and therefore will be applicable to all downstream fresh surface water classes (i.e., C, B, A, A-Special, AA, AA-Special, and their associated Trout (T) and Trout Spawning (TS) variants) and saline surface water classes (i.e., I, SC, SB, and SA), respectively. D and SD represent the most upstream classes in fresh and saline surface waters, respectively, and therefore influence all other classes. However, D and SD classes do not always represent the root class for a given WQS or GV. The root class for source water supply WQSs and GVs is A, and therefore the hierarchy only extends in sequential order from A to AA-Special. Inheritance through the hierarchy does not necessarily imply that all class have the same WQSs or GVs; in many instances, the WQSs or GVs become increasingly more restrictive moving downstream through the hierarchy. WQSs and GVs will not become less restrictive moving downstream through the hierarchy ([Dissolved Solids](#dissolved-solids) and [Total and Fecal Coliforms](#total-and-fecal-coliforms) represent discrepancies to this rule). Although most WQSs and GVs are inherited according to the logic in Figure 3, there are multiple discrepancies.

### Discrepancies

The following WQS do not follow the logic depicted in Figure 3. It is important to specifically document all of these instances because these instances will require special attention within the standardized assessment automation process.

#### Class I

In [TOGS 1.1.1](https://www.dec.ny.gov/docs/water_pdf/togs111.pdf) Part 1A-Section 3. Water Classes and Type, WQSs for the saline surface water class I should be defined for types Human Consumption of Fish (H(FC)), Aquatic Chronic (A(C)), Aquatic Acute (A(A)), Wildlife Protection (W), and Aesthetic (E). However, in Table 1 of [TOGS 1.1.1](https://www.dec.ny.gov/docs/water_pdf/togs111.pdf) and in [Title 6 NYCRR, Part 703.5](https://govt.westlaw.com/nycrr/Document/I4ed90418cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)&bhcp=1), class I water’s are frequently and inconsistently excluded from the above mentioned types; this creates a class hierarchy that follows the logic in Figure 4 rather than the logic in Figure 3. 

The following parameters are not applicable to class I waters, which deviates from the logic presented in [TOGS 1.1.1](https://www.dec.ny.gov/docs/water_pdf/togs111.pdf) Part 1A-Section 3:

1. Aldrin (309-00-2)
2. Aldrin and Dieldrin (309-00-2; 60-57-1)
3. Arsenic (NA)
4. Hexavalent Chromium (NA)
5. Endosulfan (115-29-7)
6. Endrin (72-20-8)
7. Hexachlorocyclopentadiene (77-47-4)
8. Trichlorobenzenes (87-61-6, 120-82-1, 108-70-3, 12002-48-1)
9. Azinphosmethyl (86-50-0)
10. Demeton (8065-48-3, 298-03-3, 126-75-0)
11. Hydrogen sulfide (7783-06-4)
12. Malathion (121-75-5)
13. Methoxychlor (72-43-5)
14. Mirex (2385-85-5)
15. Toxaphene (8001-35-2; A(C))

The following parameters are applicable to class I waters, which is consistant from the logic presented in [TOGS 1.1.1](https://www.dec.ny.gov/docs/water_pdf/togs111.pdf) Part 1A-Section 3:

1. Ammonia and Ammonium (7664-41-7)
2. Benzene (71-43-2)
3. Boron (NA)
4. Cadmium (NA)
5. Chlordane (57-74-9)
6. dibenzofurans (NA)
7. Total Residual Chlorine (NA)
8. Chlorobenzene (108-90-7)
9. Copper (NA)
10. Cyanide (NA)
11. p,p′-DDD (72-54-8)
12. p,p′-DDE (72-55-9)
13. p,p′-DDT (50-29-3)
14. Dieldrin (60-57-1)
15. 2,4-Dimethylphenol (105-67-9)
16. 2,4-Dinitrophenol (51-28-5)
17. Heptachlor (76-44-8)
18. Heptachlor expoxide (1024-57-3)
19. Hexachlorobenzene (118-74-1)
20. Hexachlorobutadiene (87-68-3)
21. alpha-Hexachlorocyclohexane (319-84-6)
22. beta-Hexachlorocyclohexane (319-85-7)
23. delta-Hexachlorocyclohexane (319-86-8)
24. epsilon-Hexachlorocyclohexane (6108-10-7)
25. gamma-Hexachlorocyclohexane (58-89-9)
26. Hexachloroethane (67-72-1)
27. Lead (NA)
28. Mercury (NA)
29. Methylene chloride (75-09-2)
30. Nickel (NA)
31. Octachlorostyrene (29082-74-4)
32. Polychlorinated biphenyls (NA)
33. Toluene (108-88-3)
34. Toxaphene (8001-35-2)
35. Trichloroethene (79-01-6)
36. Zinc (NA)
37. pH
38. total coliforms
39. fecal coliforms

Additionally, the class I WQS for dissolved oxygen is “Shall not be less than 4.0 mg/L at any time”, while the acute WQS for classes SD, SC, SB, and SA is “Shall not be less than 3.0 mg/L at any time.” This deviates from the general logic presented in (Figure 3B), which places class I inbetween classes SC and SB in the saline surface water hierarchy.

#### Aquatic (Acute)

Aquatic (Acute) designates a type of WQS. The class hierarchy associated with Aquatic (Acute) WQSs are treated inconsistently by NYSDEC. In many instances, the class hierarchy follows the rules depicted in Figure 3, but there are multiple instances where Aquatic (Acute) WQSs are only applicable to fresh and saline surface water classes D and SD, respectively (Figure 5).

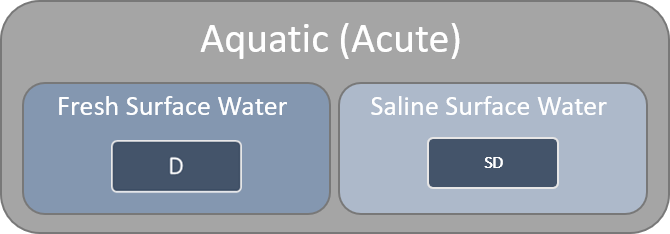
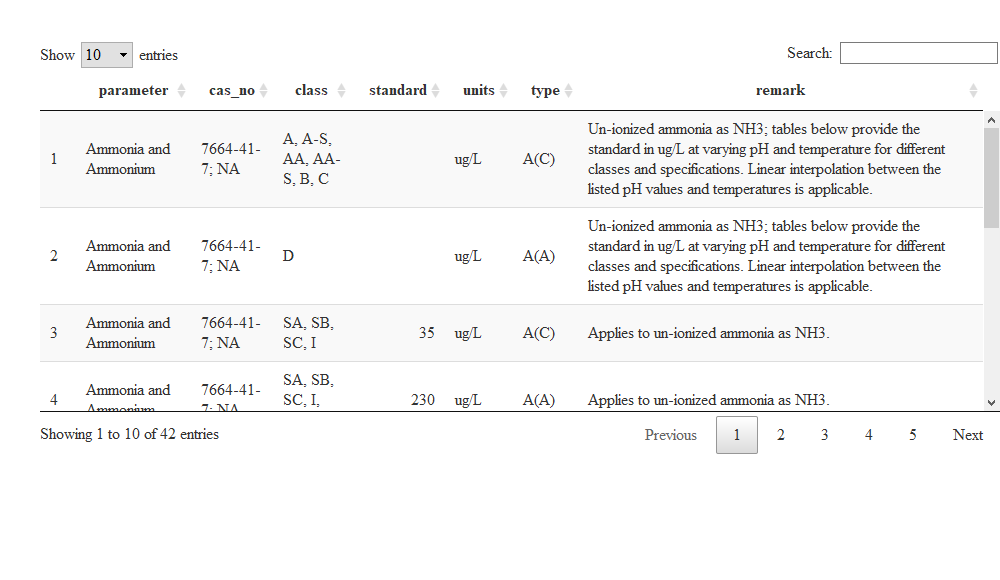


Figure 5: Many water quality standards of type Aquatic (Acute) are only applicable for fresh and saline surface waters D and SD, respectively. Therefore, Aquatic (Acute) standards are not always inherited by the classes downstream of D and SD in their respective hierarchies. There is no standaridized logic dictating when Aquatic (Acute) water quality standards are or are not inherited by their descendants.

Table (X) is a modified version of the table in [Title 6 NYCRR, Part 703.5](https://govt.westlaw.com/nycrr/Document/I4ed90418cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)&bhcp=1) subset to only include parameters associated with type Aquatic Acute; Aquatic Chronic types were also retained when they corresponded with an Aquatic Acute standard for a given parameter. In fresh surface waters the Aquatic Acute WQSs for un-ionized ammonia as NH3, benzidine, and carbofuran are only applicable to class D waters. While in saline surface waters arsenic, cadmium, hexavalent chromium, and cyanide are only applicable to class SD waters. Endosulfan and total residual chlorine were only applicable to classes D and SD within fresh and saline surface waters, respectively. In all instances described, the Aquatic Acute standards are superseded by more stringent Aquatic Chronic standards for all classes downstream in the hierarchy– except when class I’s are missing (see [Class I](#class-i)). There are also instances in Table (X) where the entire class hierarchy is specified for the Aquatic Acute type (e.g., fresh surface water arsenic and saline surface water Copper). This creates an odd discrepancy for assessments. For example, the arsenic fresh surface water Aquatic Acute and Aquatic Chronic standards are applicable to classes C, B, A, A-Special, AA, and AA-Special. Conversely, the arsenic saline surface water Aquatic Acute standard is only applicable to class SD waters, while the Aquatic Chronic standard is applicable to classes SC, SB, and SA. Thus, a class A waterbody would be assessed for both Aquatic Acute and Aquatic Chronic standards, while the saline counterpart class SA would only be assessed by the Aquatic Chronic standard. 

#### Trout and Trout Spawning Waters

Fresh surface water classes C, B, A, A-Special, AA, and AA-Special have variants designating Trout (T) and Trout Spawning (TS) waterbodies (e.g., C(T) and C(TS)). For the majority of parameters, these variants have the same WQS as the non-T/TS waterbody classes (Figure 3). Dissolved oxygen and ammonia as NH3 WQS differ between non-T/TS, T, and TS waterbody class variants (Figure 6); non-T/TS variants have the least stringent standards, while TS variants have the most stringent standards.

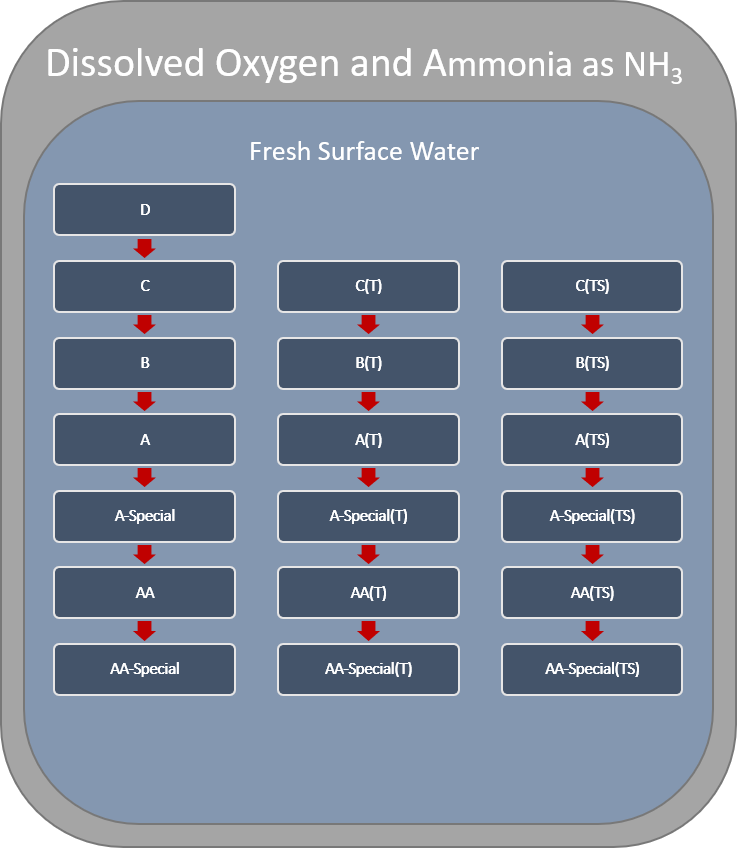


Figure 6: New York State’s fresh surface water dissolved oxygen and ammonia as NH3 water quality standards for class C, B, A, A-Special, AA, and AA-Special differ amoung Trout (T) and Trout Spawning (TS) class variants.

#### Dissolved Solids

The WQS for dissolved solids in fresh surface waters is defined as “Shall be kept as low as practicable to maintain the best usage of waters but in no case shall it exceed 500 mg/L” for classes C, B, A, AA, and AA-Special (Figure 7). The standard for class A-Special is “Shall not exceed 200 mg/L.” This deviates from the general logic depicted in Figure 3 because the A-Special class is more stringent than it’s downstream classes, AA and AA-Special.

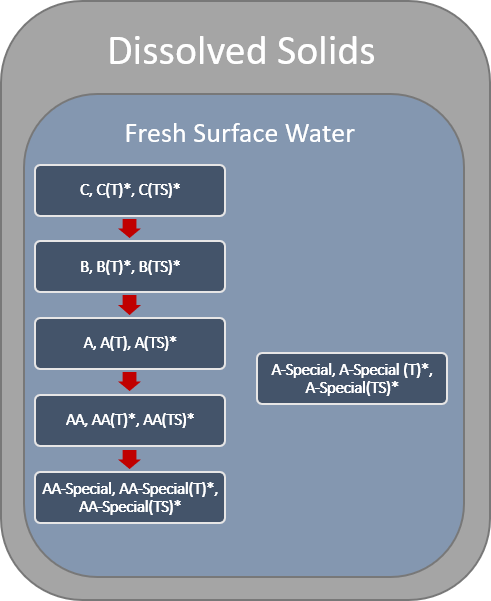
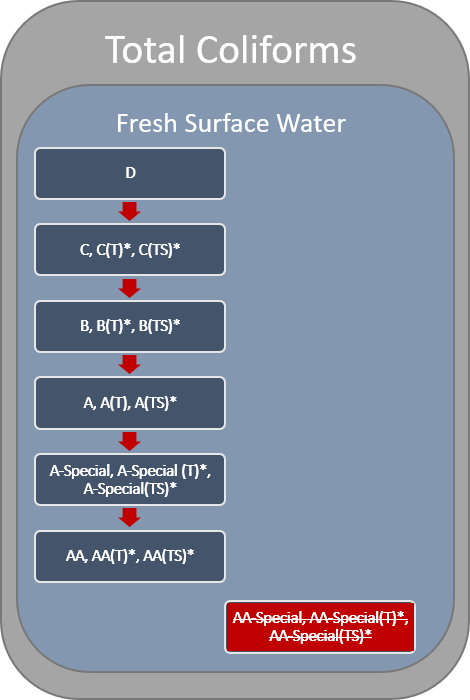


Figure 7: New York State’s fresh surface water dissolved solids water quality standards are more stringent for class A-Special than the other waterbody classes. This deviates from the general logic that the downstream classes (i.e., AA and AA-Special) will inherit the standards of class A-Special.

#### Total and Fecal Coliforms

The WQSs for total and fecal coliforms in fresh surface waters follow the logic dictated in Figure 3, except there is no total coliform standard applicable to class AA-Special (Figure 8) and there are no fecal coliform standards applicable to class AA or AA-Special (Figure 9). 

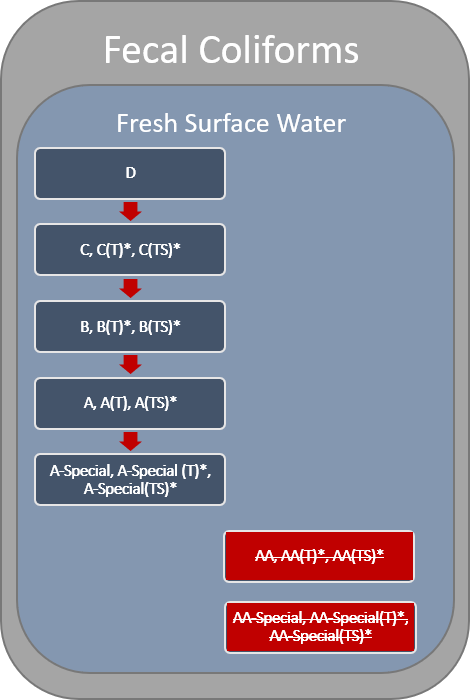


Figure 9: There are no fecal coliform standards defined for fresh water surface classes AA or AA-Special in New York State.