Water Quality Program Policy 1-11 Chapter 1

Non-Substantial Revisions

Public Review November 7, 2022 – January 6, 2023

The following are draft revisions to Water Quality Policy 1-11. These revisions provide clarification on the Water Quality Assessment (Assessment) process and address changes in Ecology's natural condition provisions in our Surface Water Quality Standards. With the exception of changes to our natural conditions methodology, these edits do not modify how Ecology conducts the Assessment. Rather, the revisions provide additional information to improve clarity and transparency in our Assessment process, based on comments and feedback received from Tribes and stakeholders. All modifications below are shown in track changes.

Please submit comments online via the e-Comment form by end of the public comment period, scheduled to end January 6, 2023.

Questions?

Justin Donahue
Water Quality Assessment Scientist
Department of Ecology
justin.donahue@ecy.wa.gov
360-628-3630

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Abbreviations, Acronyms, and Definitions

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Definitions

The following terms are defined to aid in the interpretation of the text in this policy. Terms listed below may have a different meaning outside of the WQA.

Term	Definition
303(d) List	Clean Water Act Section 303(d) List, which requires that States provide a list of impaired waters that are not meeting water quality standards.
305(b) Report	Clean Water Act Section 305(b) Report, which requires that States provide a biennial report to Congress on the water quality status of state waterbodies.
7-DADMax	Mean value of the maximum daily temperatures in a consecutive 7-day period.
7Q10 High Flow	Seven-day, consecutive high flow with a ten-year return frequency; the highest stream flow for seven consecutive days that would be expected to occur once in ten years.
7Q10 Low Flow	Seven-day, consecutive low flow with a ten-year return frequency; the lowest stream flow for seven consecutive days that would be expected to occur once in ten years.
Ambient conditions/ Ambient water quality	Chemical, physical, or biological characteristics representative of a waterbody. Water quality data are considered "ambient" when data accurately reflect the characteristic of a waterbody at the time data are being collected.
Assessment Unit (AU)	A waterbody segment or portion of a waterbody segment from which data are evaluated to determine compliance with water quality standards. Assessment units are typically delineated using the NHD reaches for fresh waters and grids for open waterbodies. AUs are the basis for identifying waterbody listings.
BioPoints	The number of points assigned to an individual BioStation based on the number of bioassay exceedances (maximum 3 bioassays per station) and the severity of the bioassay exceedance (SQS/SIZmax).

Term	Definition
BioScore	The total number of points assigned to a quarter grid resulting from the summation of the BioPoints.
BioStation	A location (i.e. station) within a quarter grid where a sediment sample was obtained and tested for biological effects using Ecology designated biological tests.
Call-for-data	A solicitation notice for parties to submit water quality data and information collected within ten years of the published end date that will be addressed in the forthcoming water quality assessment. Note that a party may submit data and information to Ecology at any time, but to ensure consideration in a specific assessment cycle, it must be received by Ecology by the published end date.
ChemPoints	The number of points assigned to an individual ChemStation based on the number of chemical exceedances and the severity of the chemical exceedance (SQS/SIZmax) at that station.
ChemScore	The total number of points assigned to a quarter grid resulting from the summation of the ChemPoints.
ChemStation	A location (i.e. station) within a quarter grid where a sediment sample was obtained and tested for chemical constituents using Ecology designated procedures.
Continuous monitoring	Sampling regime that records a series of parameter values at a defined frequency.
Critical period	A reoccurring timeframe (e.g. a specific season or time of day) during which designated uses are more susceptible to impairment. When considered in the WQA, a critical period may be defined through a TMDL study or may be assumed based on knowledge of waterbody characteristics. For example, the critical period for protecting the aquatic life use of a stream from impairment caused by high temperatures may be designated as the summer months in which high air temperatures cause water to heat up.
Data validation	An analyte-specific and sample-specific process used for certain complex chemicals that extends the evaluation of data beyond data verification to determine the usability of a specific data set. It involves a detailed examination of the data package, using both professional judgment, and objective criteria, to determine whether the method quality objectives for precision, bias, and sensitivity have been met. It may also include an assessment of completeness, representativeness, comparability and integrity, as these criteria relate to the usability of the dataset.

Term	Definition
Data verification	Examination of a dataset for errors or omissions, and assessment of the data quality indicators related to that dataset for compliance with acceptance method quality objectives.
Data window	The period of time from which data and information are evaluated during an individual WQA cycle; typically a 10-year period immediately preceding the issuance of a call-for-data for an assessment cycle.
Designated use	Designated uses are those uses specified in Chapter 173-201A WAC for waterbodies in the State, regardless of whether or not the uses are currently attained.
Epilimnion	The uppermost layer of water in a thermally stratified body of water
Exceedance	A water quality parameter result value that is greater than, or outside of the acceptable range of, a numeric water quality standard criteria.
Excursion	A water quality parameter result value that is above or below a water quality criterion expressed as an acceptable range.
Grid cell	Defines an assessment unit in marine waters, lakes of more than 1,500 acres, and estuarine areas (the tidally influenced portion of some large rivers). When assessing water quality parameters, a rectangular grid sized at 45 seconds latitude by 45 seconds longitude (approximately 2,460 feet by 3,660 feet) is used. Grid cells are divided into quarters for the purpose of evaluating toxics in sediments.
Impairment	Non-support of a designated use of a waterbody in accordance with Policy 1-11. A use is considered impaired when data and/or information indicate that water quality standards intended to protect the use are not persistently attained.
Integrated Report	A status of waterbodies, including a list of impaired waters, that states report to EPA to meet requirements of the Section 303(d) list and 305(b) report as required by the federal Clean Water Act (CWA).
Large River Assessment Unit (LRAU)	Defines assessment units that apply to the Columbia and Snake Rivers only. LRAUs are river reaches with endpoints generally delineated by the location of dams and adjacent watershed boundaries.
Listing	An evaluation of data and information compared to the water quality standards, in accordance with this policy, to determine the appropriate category for an individual waterbody segment, which is comprised of an AU/medium/parameter combination.

Term	Definition
Listing cycle	The timeframe and process of issuing the call-for-data and then assessing the data in preparation of the Washington Water Quality Assessment to meet CWA requirements in sections 303(d) and 305(b).
National Hydrography Dataset (NHD)	The National Hydrography Dataset (NHD) is a database of surface water features used to make maps. It contains features such as lakes, ponds, streams, rivers, canals, dams and stream gages for the United States at the 1:24,000 scale or better.
NHD reach	Sections of rivers and streams that serve as assessment units. In general, the endpoints of an NHD reach are located at tributary confluences, and channel intersections where a river has a braided channel morphology.
Non-detect	In general, a sample value for an analyte is designated as a non-detect when it is below the laboratory detection limit for the sample analysis. A detection limit is the concentration that is statistically greater than the concentration of a method blank with a high level of confidence (typically, 99%), or the lowest level of a given chemical that can be positively identified when using a particular analytical method. Refer to the EIM Help Center for further information about laboratory analytical reporting: https://fortress.wa.gov/ecy/eimhelp/
Numeric Water Quality Criteria	Portions of the water quality standards in WAC 173-201A-200 and 210 that address numeric water quality requirements for specific designated uses. The numeric criteria for a parameter represent a goal for the measured magnitude (level or amount) and may specify the acceptable frequency (how often) and duration (for how long) to meet the magnitude goal.
Parameter	A measurable chemical, physical, or biological attribute of a waterbody, such as bacteria or dissolved oxygen.
QA Assessment Level	The level of quality assurance performed on data that is being submittal into EIM. Refer to Section 1E of this policy for further information.
QA Planning Level	The level of quality assurance planning of a study for data being submitted into EIM. Refer to Section 1E of this policy for further information.
Surface Waters of the State	Defined in in WAC 173-201A-020 to include lakes, rivers, ponds, streams, inland waters, saltwaters, wetlands, and all other surface waters and water courses within the jurisdiction of the State of Washington.

Term	Definition
TMDL boundary	The watershed area wherein a specific TMDL study applies and wherein implementation actions must occur to meet the goals and objectives of the TMDL study.
Water Quality Assessment	A statewide report on the status of water quality of State waterbodies based on readily available data. Used to satisfy CWA sections 303(d) and 305(b) reporting requirements.
Water Quality Standards	Water quality rules that consist of water quality criteria, designated uses, and antidegradation components. The water quality standards represent the chemical, physical, and biological conditions necessary to support the state designated uses of a waterbody.
~~Waters of the State~~	~~Defined in in WAC 173-201A-101(2) to include lakes, rivers, ponds, streams, inland waters, salt waters, wetlands, and all other surface waters and water courses within the jurisdiction of the State of Washington.~~

1E. Data and Information Submittals

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Information Submittals Based on Narrative Standards

In addition to numeric criteria, Washington's water quality standards include narrative criteria at WAC 173-201A-260(2) that are designed to protect ~~designated uses for~~ fresh and marine ~~waters~~ water designated uses from adverse effects to aquatic life or public health ~~uses~~. Ecology will consider the assessment of data and information relevant to narrative ~~criteria~~ standards that demonstrates ~~impairment~~ degradation of a designated use.

Assessment of Studies to Determine Impairment based on Narrative Standards

Parts 2 and 3 of this policy describe the methodology for assessing specific water and sediment quality parameters. Most of the parameter sections focus on evaluations based on numeric criteria. However, Ecology also evaluates the attainment of designated uses based on narrative criteria. For example, narrative criteria are applied for the bioassessment parameter (to protect aquatic life uses), and for human health toxics parameters (to protect fish and shellfish harvesting and domestic water supply uses). Other examples of data and information that may be evaluated under the narrative criteria include, but are not limited to, environmental data for chemical, biological, or physical parameters for which numeric standards have not been adopted, field surveys, or site-specific water quality studies providing information on designated use support. Ecology may use narrative criteria in conjunction with numeric criteria as described in the parameter sections to make an impairment determination.

~~Ecology may also receive water quality studies from entities that provide information about designated use support and which may not address specific parameters in Part 2. For consideration in the WQA, such studies must show a link between the environmental alteration in the waterbody and the impairment of a designated use. In order to use information to make a Category 5 listing based on narrative criteria, the data submitter must provide information to show:~~

~~1. documentation of a designated use impairment in the AU, ***and***~~

~~2. documentation that deleterious, chemical, or physical alterations are causing the designated use impairment in the same AU.~~

To determine a designated use impairment based on narrative criteria in the WQA, data and information packages must demonstrate a direct link between the environmental alteration in the waterbody and the degradation of a designated use. Submittals must include the following information:

1. documentation of persistent deleterious, chemical, or physical alterations of an AU, ***and***
2. documentation of degradation of a designated use in the same AU, ***and***

3. documentation or supporting scientific evidence that directly links the deleterious, chemical, or physical alterations as the cause of the designated use degradation in the same AU.

The information provided must clearly document the connection between a persisting environmental alteration occuring within an AU and the effects to the designated use in the same AU in order to meet credible data requirements. The connection between these two lines of evidence is necessary to make a reasonable impairment determination. When sufficient information is available, an AU upstream of an impaired AU may be placed in Category 5, given there is credible data and documentation that directly links the upstream condition to the degradation of the designated use in the downstream AU.

~~For example, to create a Category 5 listing based on a study showing harm to wildlife from a specific contaminant, the study would need to demonstrate that the contaminant was causing adverse effects to wildlife, and demonstrate the source of the contaminant to be a specific waterbody. The information provided must clearly document the connection between source, cause, and effects in order to meet credible data requirements in Washington.~~

Below are examples demonstrating information needed to determine impairment of a designated use.

Wildlife Habitat

1. information documenting persistent environmental alteration or levels of a contaminant likely of human causes within an AU
2. documentation that the AU habitat has degraded in that it can no longer persistently support a resident wildlife species within the same AU
3. a rationale as to how the documented levels of that contaminant are causing the documented habitat degradation within that AU

Aesthetics

1. information documenting persistent environmental alteration or presence of a deleterious material likely of human causes in an AU
2. quantifiable documentation that the general public has indicated the waterbody as visually displeasing or producing nuisance odors
3. a rationale as to how the documented levels of alteration or contaminant are producing a visually displeasing waterbody or nuisance odor within that AU

Aquatic Life

1. information documenting persistent environmental alteration or levels of a contaminant within an AU
2. documentation that a resident species is not developing, reproducing, or surviving at the levels which are natural within that AU
3. a rationale as to how the documented levels of that environmental alteration or contaminant are causing the documented impacts to resident species within the same AU

Based on submittal requirements, field collection data alone are generally not sufficient to determine impairment of narrative standards. Rather, submittals should include a detailed rationale as how the results from field collection data within an AU directly affects a specific designated use in that AU. All data and information in the submittal must either be collected within Surface Waters of the State or have supporting information to demonstrate the data are representative of Surface Waters of the State. Any biological data or information must pertain to resident species of Surface Waters of the State. Analyses should account for natural processes and variability within systems. Ecology will not place a waterbody in Category 5 based on naturally occurring environmental processes (See Section 1G. Other Assessment Considerations: Natural Conditions, for more information).

Ecology will assess narrative information regarding impairments by non-pollutant (such as habitat or flow alterations) in the same manner and may lead to a Category 4C listing (Impairment by a Non-Pollutant).

Entities should submit any data and information packages documenting potential impacts based on narrative standards directly to the Water Quality Program, through postal mail or by email at 303d@ecy.wa.gov.~~information other than numeric data, such as a study used to make a determination based on narrative standards, directly to the Water Quality Program, through postal mail or by email at~~ 303d@ecy.wa.gov~~.~~

1G. Other Assessment Considerations

Natural Conditions

Note: On November 19, 2021, EPA disapproved Ecology's natural condition provisions in our Surface Water Quality Standards. As a result, Ecology will not utilize the following Natural Conditions methodology for waterbodies relevant to the disapproved provisions until a new natural condition provision has been adopted into our Surface Water Quality Standards and approved by EPA.

In accordance with EPA's 2006 Integrated Reporting Guidance, states are not required to place waterbody segments into impaired categories when the non-attainment of a water quality standard is due solely to non-anthropogenic sources. AUs with data indicating impairment will be placed in Category 5 unless Ecology determines that human activities do not cause or contribute to exceedances of the standards.

A natural condition determination requires data and information to substantiate that human sources do not cause or contribute to the non-attainment of water quality standards. The evaluation involves the examination of all available data from the site in question (including historic data when available), comparison to an appropriate reference site where applicable, and professional judgment based on experience in the field of freshwater and marine science. It also requires identification of a likely natural source or processes sufficient to produce the condition, and information to support that there are no human impacts or none in excess of the allowable limits. In general, Ecology assumes that water quality conditions in wilderness areas represent natural conditions due to minimal impacts from anthropogenic pollutant sources. If there is insufficient information to determine the level of human influence, then Ecology will assume that human influences have contributed to criteria exceedances and that the contribution is measurable over natural conditions.

If information or data are available to determine human activities do not cause or contribute to an AU not meeting a water quality standard, then the AU will not be considered out of compliance with the standard. Ecology must document that the non-attainment of a water quality standard is due to natural conditions, and will then place the listing in Category 1, subject to approval by EPA. Placement of AUs in Category 1 due to natural conditions do not need to meet Category 1 requirements described in the specific parameter sub-sections under Parts 2 and 3. In the absence of conclusive information about the natural condition of a waterbody, or whether a criterion exceedance is above or below the allowable threshold specified in the standards, Ecology will place the AU in Category 5 until further information or data are available to justify a change in the category determination. In this case, follow-up investigation (such as a TMDL study) will be needed to more fully characterize the extent of human influence.

Examples of natural conditions that may occur in marine waters include the presence of large-scale physical processes, such as upwelling, circulation, and heating patterns. These may result

in conditions in which human influences are not discernable from natural conditions. Ecology will place marine AUs with exceedances of criteria that are likely due to natural conditions in Category 1 if information demonstrates that the waterbody historically did not meet standards. For fresh waters, exceedances from naturally occurring metals or natural site conditions could lead to exceedances of criteria that are not caused by human influences. In any case, the determination must include conclusive documentation that human activities are not causing or contributing to the exceedance.

2H. Toxics-Aquatic Life Criteria

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Constant and calculated criteria

The criterion for a specific toxic substance is either a constant value or a calculated value that varies according to an equation in the water quality standards. Toxic substances with constant criteria have explicit numeric values in Table 240(3) in WAC 173-201A-240. The toxicity of some substances are dependent on ambient conditions of the waterbody such as hardness, temperature, or pH.~~,~~ ~~and~~ R~~r~~esults from these ancillary parameters are used to calculate the numeric criterion for a given sampling location and time. ~~These~~ Numeric criterion calculations are ~~also~~ provided in Table 240 footnotes of the water quality standards (WAC 173-201A). An important note for these criteria based on varying ambient conditions is that a calculated criterion is not a fixed value; the criterion value may vary throughout the course of a day or season due to fluctuations in water hardness, temperature, and/or pH depending upon the toxic parameter.

Assessment of the acute and chronic criteria

Ecology will reduce water quality data to a 'daily value' before category determinations are made. Samples with non-detect qualifiers will be assigned the laboratory detection limit value and will be used only when that value is below the numeric criterion. In cases where multiple samples are collected in one calendar day within an AU, Ecology will average the samples to generate a daily value. For evaluating compliance with the acute and chronic criteria, the daily value will be directly compared to the criteria (see exception below).

It is preferable to evaluate compliance with a 4-day chronic aquatic life criterion using an average sample value derived from multiple samples collected over a period of 4 days, however, it is recognized that this type of sampling is seldom conducted. In ~~the rare~~ cases when multiple samples are collected in a 4-day period, Ecology will obtain a 4-day average value as follows:

- For parameters that have constant criteria, an average will be calculated using at least 2 daily values within a 4-day period.
- For parameters that have calculated criteria (which prevents a direct comparison of an sample average to a single criterion value), a 4-day ~~n~~ average will be determined by using an exceedance factor method as follows:
  - The specific criterion for a daily value is calculated using the required ancillary data.
  - The daily value is divided by the calculated criterion to yield an exceedance factor.
  - W~~hen 2 or more daily values are available for~~ within a 4-day period, ~~the~~ an average exceedance factor is determined. An average greater than 1 indicates an exceedance of the 4-day chronic criterion. An average less than or equal to 1 indicates a non-exceedance.

Notes on parameter-specific data requirements and information are located at the end of this section.

Category Determinations

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Category 1

Requirements for Category 1 placement depend on the prior category assignment.

New listing or prior Category 2, Category 3, or Category 5 listing

Ecology will place an AU into Category 1 when:

- At least 20 daily values within a three year period are available and there are no exceedances of an acute or chronic criterion. Demonstrating compliance with a 4-day chronic criterion requires at least 20 daily values that are more than 4 days apart, with no exceedances of the criteria magnitude value. If multiple daily values are within a 4-day period, they will be averaged together for comparison to a criterion. A 4-day average is a single comparison to a chronic criterion regardless of the number of daily values averaged together. A Category 1 determination for a 4-day chronic criterion can be achieved with a combination of 4-day average values and daily values that are more than 4 days apart.
    - If an AU is currently in Category 5 or Category 2, ~~the sample data~~ at least 10 daily values must be collected during any critical period that can be inferred from previous exceedances for that toxic substance in the waterbody AU.

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2I. Toxics-Human Health Criteria

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2I(2). Fish and Shellfish Harvest Use Assessment

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Data Evaluation for Tissue Samples
Ecology will use the following factors to determine what tissue data will be used for WQA purposes:
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Data analysis

In general, Ecology will aggregate composite samples for each species for the entire period of time that the assessment cycle is addressing (e.g. estimating the median value for all composite samples collected from a given species within a 10 year period). In some cases however, more weight will be given to the most recent years when Ecology can determine that an increasing or decreasing trend in a pollutant concentration is occurring. The remarks section of a listing will note when a category determination took into account a trend in the data.

For each species, Ecology will separately compare the median composite sample value to the applicable TEC threshold(s). If only one single composite sample value is available for a species, then that sample value will be designated as the median. This method will use sample values that are qualified as estimates at the reported numeric value. ~~If a TEC threshold and a composite sample value are both below the laboratory method detection limit, it is not possible to determine if the sample is exceeding the threshold and that composite sample will not be used in the assessment.~~Composite sample values that are qualified as below a laboratory method detection limit will not be used in the assessment when the detection limit is greater than a TEC threshold. For these composite samples, it is not possible to determine if the sample value exceeds the TEC threshold.
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2I(3). Domestic Water Supply Use Assessment

Evaluating Data for Domestic Water Supply

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Data Evaluation for Water Column Samples
Ecology uses the following factors to determine what water column data will be used for WQA purposes:
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Data analysis
Data from the most recent 10 years are used. The category determination is based on the proportion (i.e. a percentile or percentage) of sample values exceeding or not exceeding the applicable DWEC threshold(s). This method will use sample values that are qualified as estimates at the reported numeric value. ~~If a DWEC and a sample value are both below the method detection limit, it is not possible to determine if the sample is exceeding the threshold and that sample will not be used in the assessment.~~Sample values that are qualified as below the method detection limit will not be used in the assessment when the detection limit is greater than a DWEC threshold. For these samples, it is not possible to determine if the sample value exceeds the DWEC threshold.
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Parameter-specific data requirements and information

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Arsenic
Ecology did not calculate a TEC_C or $DWEC_C$ for arsenic because the validity of the existing cancer slope factor developed by EPA is uncertain and currently under review. In a Technical Support Document issued in November 2016 as part of EPA's partial approval/disapproval of Washington's human health criteria, EPA noted its intent to reevaluate the existing federal arsenic human health criteria through the IRIS Toxicological Review of inorganic arsenic (total dissolved) by 2018. Given the scientific uncertainty of the cancer toxicity factors, EPA withdrew its proposal for revising criteria for arsenic in Washington and as a default left the existing criteria from the National Toxics Rule (NTR) in effect for Washington. Therefore, Ecology will not evaluate arsenic at the carcinogenic effects level by applying $DWEC_C$ or TEC_C thresholds to evaluate compliance with the narrative toxics criteria. Evaluating arsenic at carcinogenic effect levels must occur using the methodology described in 2I(1) for HHC.

Ecology will evaluate domestic water supply use support by comparing the $DWEC_N$ to total dissolved (filtered) arsenic data, with the assumption that all dissolved arsenic is of the inorganic fraction. The value of the $DWEC_N$ is equal to the MCL (10µg/L) set by the Safe Drinking Water Act for protecting drinking water supplies. Ecology will evaluate harvest use support by comparing total inorganic arsenic levels in tissue using to the TEC_N threshold. Since the TEC_N is below method detection limits, any detection of arsenic in fish tissue will result in a Category 2 or Category 5 listing. For the same reason, there will be no pathway to Category 1 based on TEC or DWEC thresholds. Existing Category 5 listings for inorganic arsenic (established using the NTR numbers) will remain in Category 5 pending an appropriate methodology to assess concentrations based on the cancer effect level. ~~When credible studies that address natural background levels of arsenic are available, Ecology will consider this information in making impairment listing decisions.~~
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Methylmercury
The numeric human health criterion for methylmercury (0.03mg/kg) is expressed as a fish tissue concentration. Category determinations for this parameter will employ the tissue criterion and follow the evaluation pathways described for non-carcinogens in the Fish and Shellfish Harvest

Use Assessment section. Methylmercury and mercury tissue data will be used to assess the criterion. Mercury and methylmercury in water will not be evaluated.