

Glossary of common terms and phrases used in Water Quality Standards rulemaking

Anadromous fish: Fish that hatch in freshwater, spend a portion of their life maturing in saltwater, then return to freshwater habitats to spawn.

Angler: One who fishes with hook and line, sometimes used to denote “fishers.”

Aquatic: From or living in a water body, including both marine and freshwater.

Bottomfish: Fish that include Pacific cod, Pacific tomcod, Pacific hake, walleye Pollock, all species of dabs, sole and founders (except Pacific halibut), lingcod and all other species of greenling, ratfish, sablefish, cabezon, buffalo sculpin, great sculpin, red Irish lord, brown Irish lord, Pacific staghorn sculpin, wolf-eel, giant wry mouth, plainfin midshipman, spiny dogfish, six gill shark, soupfin shark and all other species of shark, and all species of skate, rockfish, rattails and surfperches, except shiner perch.

Bioaccumulation factor (BAF): The ratio of a substance's concentration in tissue versus its concentration in ambient water, in situations where the organism and the food chain are exposed (USEPA, 1991a.)

Bioconcentration factor (BCF): The ratio of a substance's concentration in tissue versus its concentration in water, in situations where the food chain is not exposed or contaminated. For non-metabolized substances, it represents equilibrium partitioning between water and organisms (USEPA, 1991a.)

Carcinogen: Any substance or agent that produces or tends to produce cancer in humans. In the Water Quality Standards handbook, the term carcinogen applies to substances on the United States Environmental Protection Agency lists of A (known human) and B (probable human) carcinogens, and any substance which causes a significant increased incidence of benign or malignant tumors in a single, well conducted animal bioassay, consistent with the weight of evidence approach specified in the United States Environmental Protection Agency's Guidelines for Carcinogenic Risk Assessment in 51 FR 33992 (available online at: http://www.epa.gov/oswer/riskassessment/rcra_toxicity.htm).

Coastal waters: A term that refers to waters having a coastline that forms the boundary between land and freshwaters and marine and/or estuarine waters. This term encompasses all freshwaters of statewide significance (lakes, rivers, streams, etc.) and those marine and/or estuarine waters extending from the landward edge of a barrier beach or shoreline of coastal bay to the outer extent of the Continental Shelf.

Compliance Schedule: A schedule of remedial measures included in a permit or enforcement order, including a sequence of interim requirements (for example, actions, operations, or milestone events) that lead to compliance with the CWA and regulations.

Commercial fishers: Those individuals who harvest finfish and/or shellfish by any method from Washington State waters (marine, estuarine, and freshwaters) for economic gain as a livelihood.

Creel survey: An on-site interview with fishers to obtain information such as species caught, number, length, weight of catch and location, etc. This information is typically for use by fisheries managers; may or may not include information on consumption.

CWA: Clean Water Act (federal)

Deterministic analysis approach: An analysis that treats all of the input parameters as constants during productivity calculation and does not capture the variations possible in a situation. The current HHC calculations use a point estimate approach that provides single values (typically a mixture of average and high-end values) are input into the HHC equation. This is considered a type of deterministic analysis.

Estuarine: From an estuary, for example, a partly enclosed water body, such as an inlet of the ocean or the mouth of a river where it meets the ocean that contains brackish water (a mixture of salty and freshwater) such as Elliott Bay in Seattle, Washington.

Existing uses: Those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards (40 CFR 13 1.3.)

Federal National Toxics Rule (NTR): The federal rule that promulgates for 14 States, the chemical-specific, numeric criteria for priority toxic pollutants necessary to bring all States into compliance with the requirements of section 303(c)(2)(B) of the Clean Water Act (CWA). States determined by EPA to fully comply with section 303(c)(2)(B) requirements are not affected by the NTR.

Fish: Any of various aquatic animals (belonging to the subphylum Vertebrata) having gills, commonly fins, and bodies usually but not always covered by scales, including those having bony skeletons (bony fishes) and more primitive forms with cartilaginous skeletons (lampreys; hagfishes; and sharks, skates, and rays).

Fish consumers: People who consume finfish and/or shellfish. This term is used synonymous with Washington State fish-consuming populations.

Freshwater: Water bodies including lakes, ponds, rivers, and streams that contain water with relatively low salinity, for example, less than 0.5 parts per trillion.

Hazard quotient: The ratio of an exposure level by a contaminant (for example, maximum concentration) to a screening value selected for the risk assessment for that substance (for example, **LOAEL** or **NOAEL**). If the exposure level is higher than the toxicity value, then there is the potential for risk to the receptor.

Highly exposed population: Individuals that are represented within what is known as the “upper end” or “high-end” of an exposure distribution. A high-end exposure estimate is defined in the 1997 *EPA Guidelines for Exposure Assessment* as “a plausible estimate of individual exposure or dose for those persons at the upper end of an exposure or dose distribution, conceptually above the 90th percentile, but not higher than the individual in the population who has the highest exposure”.

Intake credit: Credits established in a permit when a discharger withdraws water from the same waterbody into which the treated effluent is discharged to account for concentrations of substances present in the water intake.

Interim criteria: Criteria that are set within permits as part of a compliance schedule that provide reasonable progress towards the final permit criteria requirements.

Interim limit: Effluent limits that are set within permits as part of a compliance schedule that provide reasonable progress towards the final permit criteria requirements.

Lowest Observed Adverse Effect Level (LOAEL): The lowest concentration or amount of a substance found by experiment or observation that causes an adverse alteration of morphology, function, capacity, growth, development, or lifespan of a target organism distinguished from normal organisms of the same species under defined conditions of exposure. Federal agencies like the EPA set approval standards like water quality standards below this level.

Marine: From, or living in, the ocean, saltwater, with a salinity of approximately 35 parts per trillion.

Mixing Zones: A defined area or volume of a receiving water surrounding, by, or adjacent to a wastewater discharge where the receiving water, as a result of the discharge, may not meet all applicable water quality criteria standards.

MTCA: Model Toxics Control Act, which governs the cleanup of contaminated sites in the state.

Multiple Discharger Variances: See **Variance** below.

Natural conditions or natural background levels: Surface water quality that was present before any human-caused pollution. When estimating natural conditions in the headwaters of a disturbed watershed it may be necessary to use the less disturbed conditions of a neighboring or similar watershed as a reference condition. (See also WAC 173-201A-Page 7260(1).)

No observed adverse effect levels (NOAEL): The level of exposure of an organism, found by experiment or observation, at which there is no biologically or statistically significant increase in the frequency or severity of any adverse effects in the exposed population when compared to its appropriate control. Some effects may be produced at this level, but they are considered as precursors to adverse effects or are not considered as adverse. In an experiment with several NOAELs, the regulatory focus is primarily on the highest one, leading to the common usage of the term NOAEL as the highest exposure without adverse effects.

Noncommercial fisher: One who fishes for recreation and/or home consumption. Synonymous with recreational fisher, sport fisher.

Nonpoint source: Pollution that enters any waters of the state from any dispersed land-based or water-based activities. These include, but are not limited to, atmospheric deposition; surface water runoff from agricultural lands, urban areas, or forest lands; subsurface or underground sources; or discharges from boats or marine vessels not otherwise regulated under the **National Pollutant Discharge Elimination System** program.

No Net Discharge: A term used to describe the requirement that the water discharged from a facility contains the same, or lower, concentrations of pollutants as the intake water. This applies to facilities that pull and discharge from the same waterbody.

NPDES: National Pollution Discharge Elimination System.

NTR: See **Federal National Toxics Rule** above.

Permit: A document issued pursuant to chapter 90.48 RCW specifying the waste treatment and control requirements and waste discharge conditions.

- **NPDES Permit:** Permit required under the Clean Water Act for any entity discharging "pollutants" through a "point source" into a "water of the United States". The permit will contain limits on what can be discharged, monitoring and reporting requirements, and other provisions to ensure that the discharge does not hurt water quality or people's health. In essence, the permit translates general requirements of the Clean Water Act into specific provisions tailored to the operations of each person discharging pollutants.

Permittee: An entity that has received or is applying for a **permit** (see above).

Probabilistic analysis approach: A general term for assessing risk using probability models to represent the likelihood of different risk levels in a population (for example, variability) or to characterize uncertainty in risk estimates. It is also used to describe a model where there are multiple possible outcomes, each having varying degrees of certainty or uncertainty of its occurrence. The EPA Risk Assessment Guidance for Superfund, Volume 3 Part A, *Process for Conducting Probabilistic Risk Assessment* notes that "Probability distributions are used to characterize inter-individual variability,

which refers to true heterogeneity or diversity in a population. Thus, variability in daily intake, for example, can be characterized by combining multiple sources of variability in exposure, such as ingestion rate, exposure frequency, exposure duration, and body weight.”

Pollution: Contamination, or other alteration of the physical, chemical, or biological properties, of any waters of the state. This includes change in temperature, taste, color, turbidity, or odor of the waters. It includes the discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state. This includes any action that would create a nuisance to waters or render such waters harmful, detrimental, or injurious to the public health, safety, or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish, or other aquatic life.

Reasonable maximum exposure (RME):

- The MTCA definition of RME (WAC 173-340-200) is as follows: Reasonable maximum exposure means the highest exposure that can be reasonably expected to occur for human or other living organisms at a site under current and potential future site use.
- The EPA definition of RME is as follows: Actions at Superfund sites should be based on an estimate of the reasonable maximum exposure (RME) expected to occur under both current and future land-use conditions. The reasonable maximum exposure is defined here as the highest exposure that is reasonably expected to occur at a site. RMEs are estimated for individual pathways (U.S.EPA, 1989b, page 6-4 to 6-5). The worst-case exposure represents an extreme set of exposure conditions, usually not observed in an actual population, which is the maximum possible exposure where everything that can plausibly happen to maximize exposure happens (U.S. EPA Guidelines for Exposure Assessment, Federal Register Notice, Vol. 57, No. 104, May 1992, pages 22888-22938).

The preamble to the National Contingency Plan further indicates that the RME will: *“...result in an overall exposure estimate that is conservative but within a realistic range of exposure. Under this policy, EPA defines “reasonable maximum” such that only potential exposures that are likely to occur will be included in the assessment of exposures. The Superfund program has always designed its remedies to be protective of all individuals and environmental receptors that may be exposed at a site; consequently, EPA believes it is important to include all reasonably expected exposures in its risk assessments...”*

Recreational fisher: One who fishes primarily for recreational purposes. Recreational catch is used primarily for home consumption. It is synonymous with noncommercial fisher, sport fisher

Relative Source Contribution (RSC): The RSC identifies or estimates the portion of a person’s total exposure attributed to water and fish consumption to account for potential exposure from other sources such as skin absorption, inhalation, other foods, and occupational exposures.

Reference concentration (RfC): An estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is

likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark concentration, with uncertainty factors generally applied to reflect limitations of the data used. The RfC is generally used in EPA's non-cancer health assessments.

Reference dose (RfD): An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark dose, with uncertainty factors generally applied to reflect limitations of the data used. The RfD is generally used in EPA's non-cancer health assessments.

Risk Level: What it means, under specific exposure assumptions:

- 10^{-4} ... a risk of *one* additional occurrence of cancer, in *ten thousand* people.
- 10^{-5} ... a risk of *one* additional occurrence of cancer, in *one hundred thousand* people.
- 10^{-6} ... a risk of *one* additional occurrence of cancer, in *one million* people.

Shellfish: Aquatic invertebrate animals having a shell. These include mollusks, clams, oysters, mussels, scallops, snails, limpets, abalone, squid, octopods, crabs, shrimps, lobsters, sea urchins, sea cucumbers and more.

Sport fish: Fish that are caught by a sport fisher that are not purchased or caught commercially. This is synonymous with sport-caught, recreationally caught, and noncommercial fish.

Sport fishers: People who harvest finfish and/or shellfish by any method from Washington State waters for recreation. Synonymous with recreational fisher or noncommercial fisher.

TMDL: Total Maximum Daily Load is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.

Use: The **existing use** identifies those uses actually attained in fresh or marine waters on or after November 28, 1975, whether or not they are designated uses. Introduced species that are not native to Washington, and put-and-take fisheries comprised of non self-replicating introduced native species, do not need to receive full support as an existing use. A **designated use** is the use specified for each water body or segment, regardless of whether or not the uses are currently attained.

Uncertainty: The lack of knowledge about specific factors, parameters, or models. For example, we may be uncertain about the mean concentration of a specific pollutant at a contaminated site or we may be uncertain about a specific measure of uptake (for example, the 95th percentile fish consumption rate among all adult males in the United States). (Source: <http://www.epa.gov/raf/publications/pdfs/montecar.pdf>)

Variability: Refers to observed differences attributable to true heterogeneity or diversity in a population or exposure parameter. Sources of variability are the result of natural random processes and stem from environmental, lifestyle, and genetic differences among humans. Examples include human physiological variation (for example, natural variation in bodyweight, height, breathing rates, and drinking water intake rates), weather variability, and variation in soil types and differences in contaminant concentrations in the environment. Variability is usually not reducible by further measurement or study (but can be better characterized). (Source: <http://www.epa.gov/raf/publications/pdfs/montecar.pdf>)

Variance: A time-limited change in the water quality standards, typically of three-to five-year duration, with renewals possible (Guidance: Coordinating CSO Long-Term Planning with Water Quality Standards Reviews EPA 833-R-01-002 July 1, 2001).

- An **Individual Variance** is provided to a single permittee.
- A **Multiple Discharger Variance** is written for more than one permittee. For example, the Michigan Department of Natural Resources and the Environment adopted, and EPA subsequently approved, a multi-discharger variance for mercury. This variance was part of a broader strategy for addressing mercury in NPDES permitted discharges as a way to address the widespread inability of municipal dischargers to meet limits based on the mercury criterion.
- A **Waterbody Variance** is a type of Multiple Discharger Variance that is written specifically for an entire waterbody or waterbody segment.

Waterbody Variance: see **Variance** above.

303(d) list: Under Section 303(d) of the federal Clean Water Act, every two years a state is required to develop a list of water bodies that don't meet water quality standards. This list is called the 303(d) list. Plans for addressing pollutants in these waterbodies are called **TMDL** (see below) plans.

An additional resource: EPA Water Quality Handbook Glossary:

<http://water.epa.gov/scitech/swguidance/standards/handbook/glossary.cfm>

Common Acronyms

API - Asian and Pacific Islander

ATSDR - Agency for Toxic Substances and Disease Registry

Bw - body weight

BRFSS - Behavioral Risk Factor Surveillance System

CDC - Centers for Disease Control and Prevention

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

CRITFC - Columbia River Inter-Tribal Fish Commission

CSFII - Continuing Survey of Food Intakes by Individuals

DOH - Washington State Department of Health

EPA - U.S. Environmental Protection Agency

g/day - grams per day

g/kg - grams per kilogram

µg/kg - micrograms per kilogram

µg/L - micrograms per liter

µg/mg - micrograms per milligram

NCI - National Cancer Institute

NHANES - National Health and Nutrition Examination Survey

NOAA - National Oceanic and Atmospheric Administration

NTR - National Toxics Rule, Federal

Oregon DEQ - Oregon Department of Environmental Quality

OFM - Office of Financial Management

PAH - polycyclic aromatic hydrocarbon

PBDE - polybrominated diphenyl ether

PBT - persistent bioaccumulative toxic

PCB - polychlorinated biphenyl

POP - persistent organic pollutant

QA/QC - quality assurance/quality control

RCRA - Resource Conservation and Recovery Act

RME - reasonable maximum exposure

SaSI - Salmonid Stock Inventory

SMS - Sediment Management Standards

U.S. - United States