



Ohio Administrative Code Rule 3745-1-02 Definitions.

Effective: February 6, 2017

[Comment: For dates of non-regulatory government publications, publications of recognized organizations and associations, federal rules and federal statutory provisions referenced in this rule, see rule 3745-1-03 of the Administrative Code.]

(A) Acronyms and abbreviations used in this chapter shall be defined as listed in this paragraph.

AAC	Acute aquatic criterion
AAV	Acute aquatic value
ACR	Acute-chronic ratio
ADE	Acceptable daily exposure
AIM	Area of initial mixing
BAF	Bioaccumulation factor
BCC	Bioaccumulative chemical of concern
BCF	Bioconcentration factor
BSAF	Biota-sediment accumulation factor
BW	Body weight
CAC	Chronic aquatic criterion
CAV	Chronic aquatic value
CBOD ₅	Five-day carbonaceous biochemical oxygen demand
CCC	Criterion continuous concentration
C.F.R.	Code of federal regulations
CMC	Criterion maximum concentration
DOC	Dissolved organic carbon
ECBP	Eastern corn belt plains ecoregion
EC ₅₀	Median effective concentration
EOLP	Erie/Ontario lake plain ecoregion
EPA	Environmental protection agency
FACR	Final acute-chronic ratio



AUTHENTICATED,
OHIO LEGISLATIVE SERVICE
COMMISSION
DOCUMENT #237338

FAV	Final acute value
FCM	Food-chain multiplier
FCV	Final chronic value
FPV	Final plant value
GMAV	Genus mean acute value
GMCV	Genus mean chronic value
HCC	Human cancer criterion
HCV	Human cancer value
HELP	Huron/Erie lake plain ecoregion
HNC	Human noncancer criterion
HNV	Human noncancer value
IMZM	Inside mixing zone maximum
IP	Interior plateau ecoregion
IRIS	Integrated risk information system
K_{OW}	Octanol-water partition coefficient
LC_{50}	Median lethal concentration
ln	Natural logarithm
LOAEL	Lowest observed adverse effect level
log	Base ten logarithm
MF	Membrane filter
MPN	Most probable number
NIPDWR	National interim primary drinking water regulations
NOAEL	No observed adverse effect level
NPDES	National pollutant discharge elimination system
OMZA	Outside mixing zone average
OMZM	Outside mixing zone maximum
POC	Particulate organic carbon
POTW	Publicly owned treatment works
q_1^*	Cancer slope factor
RAD	Risk associated dose
RSC	Relative source contribution
S	Soluble



SACR	Secondary acute-chronic ratio
SAF	Secondary acute factor
SAR	Structure-activity relationship
SAV	Secondary acute value
SMAV	Species mean acute value
SMCV	Species mean chronic value
T	Total
TD	Test dose
temp	Temperature
TL	Trophic level
TR	Total recoverable
UF	Uncertainty factor
U.S.C.	United States Code
WAP	Western Allegheny plateau ecoregion
WV	Wildlife value

(B) Technical words used in this chapter shall be defined as listed in this paragraph.

(1) "Acceptable daily exposure" or "ADE" means an estimate of the maximum daily dose of a substance which is not expected to result in adverse noncancer effects to the general human population, including sensitive subgroups.

(2) "Act" means the federal Water Pollution Control Act.

(3) "Acute aquatic criterion" or "AAC" means the Ohio EPA estimation of the highest instream concentration of a chemical to which aquatic organisms can be exposed for a brief period of time without causing mortality.

(4) "Acute-chronic ratio" or "ACR" means a standard measure of the acute toxicity of a material divided by an appropriate measure of the chronic toxicity of the same material under comparable conditions.

(5) "Acute mixing zone" means the mixture of receiving water and effluent adjacent to a treated or



untreated discharge within which the acute aquatic life criteria may be exceeded but the inside mixing zone maximum criteria may not be exceeded. The acute aquatic life criteria shall be met on the downstream perimeter of the acute mixing zone.

(6) "Acute toxicity" means adverse effects that result from an acute exposure and occur within any short observation period which begins when the exposure begins, and usually does not constitute a substantial portion of the life span of the organism.

(7) "Adverse effect" means any deleterious effect to organisms due to exposure to a substance. This includes effects which are or may become debilitating, harmful or toxic to the normal functions of the organism, but does not include non-harmful effects such as tissue discoloration alone or the induction of enzymes involved in the metabolism of the substance.

(8) "Ambient water temperature" means the spatial (longitudinal, lateral and vertical) and temporal water temperature measured in the receiving body of water prior to a specific waste heat discharge, and is outside the influence of any thermal mixing zone.

(9) "Area of initial mixing" or "AIM" means the limited zone where discharge-induced mixing causes the effluent to rapidly mix with the receiving water such that the area may not be physically inhabitable to aquatic life. The inside mixing zone maximum criteria may be exceeded within the AIM but shall be met on the perimeter of the AIM.

(10) "Average temperature" represents the arithmetic mean of multiple daily average temperatures over a consecutive fifteen- or thirty-day period.

(11) "Baseline BAF" means:

(a) For organic chemicals, a BAF that is based on the concentration of freely dissolved chemical in the ambient water and takes into account the partitioning of the chemical within the organism.

(b) For inorganic chemicals, a BAF that is based on the wet weight of the tissue.

(12) "Baseline BCF" means:



(a) For organic chemicals, a BCF that is based on the concentration of freely dissolved chemical in the ambient water and takes into account the partitioning of the chemical within the organism.

(b) For inorganic chemicals, a BCF that is based on the wet weight of the tissue.

(13) "Bioaccumulation" means the net accumulation of a substance by an organism as a result of uptake from all environmental sources.

(14) "Bioaccumulation factor" or "BAF" means the ratio (in l/kg) of a substance's concentration in the tissue of an aquatic organism to its concentration in the ambient water, in situations where both the organism and its food are exposed and the ratio does not change substantially over time.

(15) "Bioaccumulative chemical of concern" or "BCC" is any chemical that has the potential to cause adverse effects which, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor greater than one thousand, after considering metabolism and other physicochemical properties that might enhance or inhibit bioaccumulation, calculated in accordance with the methodology in rule 3745-1-41 of the Administrative Code. Chemicals with half-lives of less than eight weeks in the water column, sediment, and biota are not BCCs. The minimum BAF information needed to define an organic chemical as a BCC is either a field-measured BAF or a BAF derived using the BSAF methodology. The minimum BAF information needed to define an inorganic chemical, including an organometal, as a BCC is either a field-measured BAF or a laboratory-measured BCF. Bioaccumulative chemicals of concern include, but are not limited to, chlordane, 4,4'-DDD (p,p'-DDD, 4,4'-TDE, p,p'-TDE), 4,4'-DDE (p,p'-DDE), 4,4'-DDT (p,p'-DDT), dieldrin, hexachlorobenzene, hexachlorobutadiene (hexachloro-1,3-butadiene), hexachlorocyclohexanes (BHCs), alpha-hexachlorocyclohexane (alpha-BHC), beta-hexachlorocyclohexane (beta-BHC), delta-hexachlorocyclohexane (delta-BHC), lindane (gamma-hexachlorocyclohexane, gamma-BHC), mercury, mirex, octachlorostyrene, PCBs (polychlorinated biphenyls), pentachlorobenzene, photomirex, 2,3,7,8-TCDD (dioxin), 1,2,3,4-tetrachlorobenzene, 1,2,4,5-tetrachlorobenzene, and toxaphene.

(16) "Bioconcentration" means the net accumulation of a substance by an aquatic organism as a result of uptake directly from the ambient water through gill membranes or other external body



surfaces.

(17) "Bioconcentration factor" or "BCF" means the ratio (in l/kg) of a substance's concentration in the tissue of an aquatic organism to its concentration in the ambient water, in situations where the organism is exposed through the water only and the ratio does not change substantially over time.

(18) "Biota-sediment accumulation factor" or "BSAF" means the ratio (in kg of organic carbon/kg of lipid) of a substance's lipid-normalized concentration in the tissue of an aquatic organism to its organic carbon-normalized concentration in surface sediment, in situations where the ratio does not change substantially over time, both the organism and its food are exposed, and the surface sediment is representative of average surface sediment in the vicinity of the organism.

(19) "C" means degree Celsius.

(20) "Carcinogen" means a substance which causes an increased incidence of benign or malignant neoplasms, or substantially decreases the time to develop neoplasms, in animals or humans. The classification of carcinogens is discussed in rule 3745-1-42 of the Administrative Code.

(21) "Chronic aquatic criterion" or "CAC" means the Ohio EPA estimation of the highest instream concentration of a chemical to which aquatic organisms can be exposed indefinitely without causing unacceptable effects (e.g., adverse effects on growth or reproduction)

(22) "Chronic mixing zone" means the mixture of receiving water and effluent adjacent to a treated or untreated discharge within which the chronic aquatic life, human health, wildlife and agricultural water supply criteria may be exceeded. The chronic aquatic life, human health, wildlife and agricultural water supply criteria shall be met on the downstream perimeter of the chronic mixing zone.

(23) "Chronic toxicity" means concurrent and delayed adverse effects that occur only as a result of a chronic exposure. Chronic exposure is exposure of an organism for any long period or for a substantial portion of its life span.

(24) "Coldwater fish" means those species of fish that thrive in relatively cold water. These species



include, but are not limited to, salmon and trout (Salmonidae), and may include sculpins (Cottidae), and certain minnow (Cyprinidae) species.

(25) "Confluence" means the point where two or more bodies of water flow together.

(26) "Criteria" mean elements of water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular designated use.

(27) "Criterion continuous concentration" or "CCC" means an estimate of the highest concentration of a material in the water column to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect.

(28) "Criterion maximum concentration" or "CMC" means an estimate of the highest concentration of a material in the water column to which an aquatic community can be exposed briefly without resulting in an unacceptable effect.

(29) "Daily average temperature" means the arithmetic mean of multiple temperature measurements to be taken at least once per hour during a twenty-four-hour day.

(30) "Degradation" means a lowering of the existing water quality in the surface waters of the state.

(31) "Depuration" means the loss of a substance from an organism as a result of any active or passive process.

(32) "Designated use" means a use of the surface waters of the state, established by this chapter.

(33) "Director" means the director of the Ohio environmental protection agency.

(34) "Discharge" means the addition of any pollutant to the waters of the state from a point source.

(35) "Discharge induced mixing" means the state of mixing between the receiving water and effluent where the processes causing the mixing are induced primarily by the momentum of the effluent as it



enters the receiving water.

(36) "E. coli" means a specific bacterial species included in the fecal coliform bacteria group, the presence of which in surface waters has been correlated with gastrointestinal illness in swimmers.

(37) "EC₅₀" means the median effective concentration and is a statistically or graphically estimated concentration that is expected to cause one or more specified effects in fifty per cent of a group of organisms under specified conditions.

(38) "Estuary" means the section of a lake Erie tributary near the mouth where tributary and lake Erie waters mix. This area is characterized by flow reversals and seiche influences and is generally located between the farthest downstream riffle of the tributary and lake Erie proper. All tributaries of estuaries shall be considered estuaries below the lake Erie mean high water level.

(39) "F" means degree Fahrenheit.

(40) "Fecal coliform" means the portion of the coliform group of bacteria which is present in the intestinal tract of warmblooded animals, and is evidence of the presence of human or animal wastes.

(41) "Final acute value" or "FAV" means either of the following:

(a) A calculated estimate of the concentration of a test material such that ninety-five per cent of the genera (with which acceptable acute toxicity tests have been conducted on the material) have higher GMAVs.

(b) The SMAV of an important or critical species, if the SMAV is lower than the calculated estimate.

(42) "Final chronic value" or "FCV" means any one of the following:

(a) A calculated estimate of the concentration of a test material such that ninety-five per cent of the genera (with which acceptable chronic toxicity tests have been conducted on the material) have higher GMCVs.



- (b) The quotient of an FAV divided by an appropriate acute-chronic ratio.
- (c) The SMCV of an important and/or critical species, if the SMCV is lower than the calculated estimate or the quotient, whichever is applicable.
- (43) "Final plant value" or "FPV" means the lowest plant value obtained with an important aquatic plant species in an acceptable toxicity test for which the concentrations of the test material were measured and the adverse effect was biologically important.
- (44) "Food-chain multiplier" or "FCM" means the ratio of a BAF to an appropriate BCF. A food-chain multiplier is meant to account for accumulation of a chemical up the food chain attributable to predation (i.e., between successive trophic levels).
- (45) "Genus mean acute value" or "GMAV" means the geometric mean of the SMAVs for the genus.
- (46) "Genus mean chronic value" or "GMCV" means the geometric mean of the SMCVs for the genus.
- (47) "Geometric mean" means the Nth root of the product of N quantities.
- (48) "Great Lakes system" means all the streams, rivers, lakes and other bodies of water within the drainage basin of the Great Lakes within the United States.
- (49) "Human cancer criterion" or "HCC" is a human cancer value for a pollutant that meets the minimum data requirements for tier I as specified in rule 3745-1-42 of the Administrative Code.
- (50) "Human cancer value" or "HCV" is the maximum ambient water concentration of a substance at which a lifetime of exposure from either: drinking the water, consuming fish from the water, and water-related recreation activities; or consuming fish from the water, and water-related recreation activities, will represent a plausible upper-bound risk of contracting cancer of one in one hundred thousand using the exposure assumptions specified in the methodologies for the development of human health criteria and values in rule 3745-1-42 of the Administrative Code.



(51) "Human noncancer criterion" or "HNC" is a human noncancer value for a pollutant that meets the minimum data requirements for tier I as specified in rule 3745-1-42 of the Administrative Code.

(52) "Human noncancer value" or "HNV" is the maximum ambient water concentration of a substance at which adverse noncancer effects are not likely to occur in the human population from lifetime exposure from either: drinking the water, consuming fish from the water, and water-related recreation activities; or consuming fish from the water and water-related recreation activities, using the methodologies for the development of human health criteria and values in rule 3745-1-42 of the Administrative Code.

(53) "Lake Erie drainage basin" means all the streams, rivers, lakes and other bodies of water within the drainage basin of lake Erie and within the United States.

(54) "LC₅₀" means the median lethal concentration and is a statistically or graphically estimated concentration that is expected to be lethal to fifty per cent of a group of organisms under specified conditions.

(55) "Linearized multistage model" means a conservative mathematical model for cancer risk assessment. This model fits linear dose-response curves to low doses. It is consistent with a no-threshold model of carcinogenesis, i.e., exposure to even a very small amount of the substance is assumed to produce a finite increased risk of cancer.

(56) "Lowest observed adverse effect level" or "LOAEL" means the lowest tested dose or concentration of a substance which results in an observed adverse effect in exposed test organisms when all higher doses or concentrations result in the same or more severe effects.

(57) "Maximum daily temperature" means the highest temperature observed in a twenty-four-hour day.

(58) "Micrograms per liter (ug/l)" means the micrograms of substance per liter of solution, and is equivalent to 10⁻⁹ kilograms per liter or parts per billion, assuming unit density.

(59) "Milligrams per kilogram (mg/kg)" means the milligrams of substance per kilogram of weight.



(60) "Milligrams per liter (mg/l)" means the milligrams of substance per liter of solution, and is equivalent to 10^{-6} kilograms per liter or parts per million, assuming unit density.

(61) "Mine drainage" means surface or groundwater flowing through or from mines and mine sites. It is usually characterized by concentrations of acidity or alkalinity, various heavy metals, sulfates, and dissolved solids.

(62) "Mixing zone" means an area of a water body contiguous to a treated or untreated wastewater discharge. This discharge is in transit and progressively diluted from the source concentration to the receiving system concentration. The mixing zone shall be considered a place where wastewater and receiving water mix, not a place where wastes are treated.

(63) "Nanograms per liter (ng/l)" means the nanograms of substance per liter of solution, and is equivalent to 10^{-12} kilograms per liter or parts per trillion, assuming unit density.

(64) "Natural conditions" mean those conditions that are measured outside the influence of human activities.

(65) "New discharge", for the purposes of implementing the bioaccumulative chemical of concern provisions in Chapter 3745-2 of the Administrative Code, means any of the following:

(a) A discharge of pollutants to a water body from a building, structure, facility or installation, the construction of which commences after December 30, 2002.

(b) A new discharge from an existing discharger that commences after December 30, 2002.

(c) An expanded discharge from an existing discharger that commences after December 30, 2002, except for those expanded discharges resulting from changes in loadings of any BCC within the existing capacity and processes (e.g., normal operational variability, changes in intake water pollutants, increasing the production hours of the facility or adding additional shifts, or increasing the rate of production), and that are covered by the existing Ohio national pollutant discharge elimination system permit.



Not included within the definition of "new discharge" are new or expanded discharges of BCCs from a publicly owned treatment works when such discharges are necessary to prevent a public health threat to the community (e.g., a situation where a community with failing septic systems is connected to a POTW to avert a potential public health threat from these failing systems). These and all other discharges of BCCs are defined as existing discharges.

(66) "No observed adverse effect level" or "NOAEL" means the highest tested dose or concentration of a substance which results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

(67) "Nonpoint source" means any source of pollutants other than those defined as point sources.

(68) "Octanol-water partition coefficient" or " K_{ow} " means the ratio of the concentration of a substance in the N-octanol phase to its concentration in the aqueous phase in an equilibrated two-phase octanol-water system. For $\log K_{ow}$, the log of the octanol-water partition coefficient is a base ten logarithm.

(69) "Ohio river drainage basin" means all the streams, rivers, lakes and other bodies of water within the drainage basin of the Ohio river.

(70) "pH" means the negative logarithm of the hydrogen ion activity concentrations when expressed as moles per liter or $\text{pH} = -\log (\text{H}^+)$.

(71) "Picograms per liter (pg/l)" means the picograms of substance per liter of solution, and is equivalent to 10^{-15} kilograms per liter or parts per quadrillion, assuming unit density.

(72) "Point source" means any discernible, confined or discrete conveyance from which a pollutant is or may be discharged to the surface waters of the state.

(73) "Pollutant" means sewage, industrial waste or other waste as defined by divisions (B) to (D) of section 6111.01 of the Revised Code.



(74) "Pollution prevention alternatives assessment" means an analysis that identifies any cost-effective pollution prevention alternatives and techniques that are available to the discharger, and that would reduce the extent to which the increased loading results in a lowering of water quality. A pollution prevention alternatives analysis shall demonstrate a good faith effort by the discharger to review equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials and improvements to housekeeping. The discharger is not required to implement a pollution prevention alternative if it is not technically or economically feasible.

(75) "Receiving waters" mean the surface waters of the state into which point and nonpoint sources flow.

(76) "Relative source contribution" or "RSC" means the factor (percentage) used in calculating a HNV or HNC to account for all sources of exposure to a contaminant. The RSC reflects the per cent of total exposure which can be attributed to surface water through water intake and fish consumption.

(77) "Representative aquatic species" mean those organisms, either natural or introduced, which presently exist or have existed in the surface waters of the state prior to July 1, 1977, with the exception of those banned species outlined in rule 1501:31-19-01 of the Administrative Code. In addition, it may include any species that are legally introduced into the surface waters of the state. Aquatic species designated as representative shall satisfy one or more of the following:

(a) Species that are particularly vulnerable to the existing or proposed environmental impact in question.

(b) Species that are commercially or recreationally valuable.

(c) Species that are threatened, rare, or endangered.

(d) Species that are critical to the structure and function of the aquatic community.

(e) Species whose presence is causally related to the existing or proposed environmental impact



under examination.

(f) Species that are potentially capable of becoming localized nuisance species.

(g) Species that are representative of the ecological, behavioral, and physiological requirements and characteristics of species determined in paragraphs (B)(77)(a) to (B)(77)(f) of this rule, but which themselves may not be representative.

(78) "Risk associated dose" or "RAD" means a dose of a known or presumed carcinogenic substance in (mg/kg) /day which, over a lifetime of exposure, is estimated to be associated with a plausible upper bound incremental cancer risk equal to one in one hundred thousand.

(79) "Slope factor" or " Q_1^* " means the incremental rate of cancer development calculated through use of a linearized multistage model or other appropriate model. It is expressed in (mg/kg/day) of exposure to the chemical in question.

(80) "Species mean acute value" or "SMAV" means the geometric mean of the results of all acceptable flow-through acute toxicity tests (for which the concentrations of the test material were measured) with the most sensitive tested life stage of the species. For a species for which no such result is available for the most sensitive tested life stage, the SMAV is the geometric mean of the results of all acceptable acute toxicity tests with the most sensitive tested life stage.

(81) "Species mean chronic value" or "SMCV" means the geometric mean of the results of all acceptable life-cycle and partial life-cycle toxicity tests with the species; for a species of fish for which no such result is available, the SMCV is the geometric mean of all acceptable early life-stage tests.

(82) "Structure-activity relationship" or "SAR" means a mathematical relationship between a property (i.e., biological activity or response) of a chemical and a number of descriptors of the chemical. These descriptors are chemical or physical characteristics obtained experimentally or predicted from the structure of the chemical.

(83) "Surface waters of the state" or "water bodies" mean all streams, lakes, reservoirs, ponds,



marshes, wetlands or other waterways which are situated wholly or partially within the boundaries of the state, except those private waters which do not combine or effect a junction with natural surface or underground waters. Waters defined as sewerage system, treatment works or disposal system in section 6111.01 of the Revised Code are not included.

(84) "Thermal mixing zone" means that portion of a water body into which waste heat is discharged and assimilated, and within which the average and maximum daily average temperatures do not apply, except as prescribed by this chapter.

(85) "Threatened or endangered species" mean those species of the state's biota which are threatened with statewide extirpation or national extinction, as listed in rule 1501:31-23-01 of the Administrative Code or 50 C.F.R. 17 or that are listed as endangered or threatened under section 4 of the Endangered Species Act.

(86) "Threshold effect" means an effect of a substance for which there is a theoretical or empirically established dose or concentration below which the effect does not occur.

(87) "Tier I criteria" mean numeric values derived by use of the tier I methodologies specified in rules 3745-1-40, 3745-1-42 and 3745-1-43 of the Administrative Code, that either have been adopted as numeric criteria into a water quality standard or are used to implement narrative water quality criteria.

(88) "Tier II values" means numeric values derived by use of the tier II methodologies specified in rules 3745-1-40 and 3745-1-42 of the Administrative Code that are used to implement narrative water quality criteria.

(89) "Toxic substances" mean any substances which can cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological or reproductive malfunction or physical deformities in any organism or its offspring, or which can become poisonous after concentration in the food chain or in combination with other substances.

(90) "Tributary" means a stream flowing into a larger body of water.



(91) "Uncertainty factor" or "UF" means one of several numeric factors used in operationally deriving criteria from experimental data to account for the quality or quantity of the available data.

(92) "Uptake" means acquisition of a substance from the environment by an organism as a result of any active or passive process.

(93) "Use attainability analysis" means a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors.

(94) "Warmwater fish" means those species of fish that inhabit relatively warm water. These species include, but are not limited to, bass; crappies and sunfish (Centrarchidae), and catfish (Ictaluridae), and may include certain suckers (Catostomidae), minnows (Cyprinidae), and perch and darter (Percidae) species.

(95) "Water bodies" or "waters of the state" mean all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, that are situated wholly or partly within, or border upon, this state, or are within its jurisdiction, except those private waters that do not combine or effect a junction with natural surface or underground waters.

(96) "Water quality standards" means the rules set forth in this chapter establishing stream use designations and water quality criteria protective of such uses for the surface waters of the state.

(97) "Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration that are sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. "Wetlands" includes swamps, marshes, bogs, and similar areas that are delineated in accordance with the 1987 United States army corps of engineers wetland delineation manual and any other procedures and requirements adopted by the United States army corps of engineers for delineating wetlands.