

STATE OF OHIO  
IMPLEMENTATION OF WATER QUALITY STANDARDS

Chapter 3745-2 of the ADMINISTRATIVE CODE

Most Recent Revision:

Adopted January 4, 2024  
Effective April 4, 2024

Ohio Environmental Protection Agency  
Division of Surface Water  
Modeling & Assessment Section

## TABLE OF CONTENTS

OAC Rule #	Rule Title	Effective Date
3745-2-01	Purpose and applicability .....	3/1/2018
3745-2-02	Definitions .....	3/1/2018
3745-2-03	Application of biological survey data to development of ..... water quality-based effluent limitations.	4/4/2024
3745-2-04	Determinations preliminary to development of water quality-based effluent limitations .....	2/15/2019
3745-2-05	Calculating wasteload allocations .....	3/1/2018
3745-2-06	Application of preliminary effluent limitations .....	3/1/2018
3745-2-07	Additive effects of pollutants .....	3/1/2018
3745-2-09	Whole effluent toxicity provisions and water quality based effluent limit calculation procedures .....	2/6/2017
3745-2-10	Wasteload allocation for ammonia-nitrogen toxicity .....	2/15/2019
3745-2-11	Dissolved oxygen modeling .....	3/1/2018
3745-2-12	Total maximum daily loads .....	2/15/2019

## LIST OF TABLES

Table #	Table Title	Page #
<u>OAC rule 3745-2-07</u>		
1	TEFs and BEFs for chlorinated dibenzo dioxins and chlorinated dibenzo furans .....	2

3745-2-01      **Purpose and applicability.**

The purpose of this chapter is to provide for the attainment and protection of the surface water quality standards (WQS) established in Chapter 3745-1 of the Administrative Code. This chapter sets forth rules for developing water quality based effluent limitations for point sources and total maximum daily loads (TMDLs) for discharges of any pollutant requiring control, including toxic, carcinogenic, and organoleptic pollutants. This chapter specifies how to determine when a wasteload allocation is necessary, how to calculate a wasteload allocation, how to determine the reasonable potential of a pollutant to cause or contribute to an excursion of the WQS, and how to develop a TMDL for a pollutant. Except as provided in paragraph (M) of rule 3745-2-12 of the Administrative Code, the methods in this chapter do not apply to establishing controls on the discharge of any pollutant by a wet weather point source. Wasteload allocations and TMDLs for wet weather point sources are determined using stream or basin specific models.

Effective: 3/1/2018

Five Year Review (FYR) Dates: 11/15/2017 and 03/01/2023

Promulgated Under: R.C. 119.03

Statutory Authority: R.C. 6111.03, 6111.12

Rule Amplifies: R.C. 6111.12

Prior Effective Dates: 10/31/1997

**3745-2-02 Definitions.**

(A) Acronyms and abbreviations used in this chapter are defined as listed below.

BAF	Bioaccumulation factor
BCC	Bioaccumulative chemical of concern
BCF	Bioconcentration factor
BSAF	Bioto-sediment accumulation factor
C.F.R.	Code of federal regulations
D.O.	Dissolved oxygen
DMT	Dissolved metal translator
FAV	Final acute value
HMQ	Harmonic mean flow
IC	Inhibition concentration
IMZM	Inside mixing zone maximum
LAMP	Lakewide management plan
LOEC	Lowest observed effect concentration
LA	Load allocation
LC	Lethal concentration
NOEC	No observed effect concentration
NPDES	National pollutant discharge elimination system
OMZM	Outside mixing zone maximum
PQL	Practical quantification level
PEL	Preliminary effluent limit
PEQ	Projected effluent quality
POTW	Publicly owned treatment works
Q	Flow, as in 7Q10
RAP	Remedial action plan
SDR	Stream-to-discharge ratio
TCDD	Tetrachloro-dibenzo dioxin
TMDL	Total maximum daily load
TU <sub>a</sub>	Acute toxic unit
TU <sub>c</sub>	Chronic toxic unit
U.S.C.	United States Code
U.S. EPA	United States environmental protection agency
WLA	Wasteload allocation
WQBEL	Water quality based effluent limit
WET	Whole effluent toxicity

(B) Technical words used in this chapter shall be defined as follows:

- (1) "1Q10," see stream design flow.
- (2) "30Q10," see stream design flow.
- (3) "7Q10," see stream design flow.
- (4) "90Q10," see stream design flow.
- (5) "Act" means the federal Water Pollution Control Act (commonly referred to as the "Clean Water Act"), 33 U.S.C. 1251 to 1274 as amended through July 1, 2017.

[Comment: The Water Pollution Control Act can generally be found in public libraries, and can be viewed electronically online at <http://www.gpo.gov/fdsys> and purchased through: "U.S. Government Publishing Office Bookstore, 701 North Capital Street N.W., Washington, DC 20401."]

- (6) "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.
- (7) "Ambient screening values" mean numbers that estimate the concentration of a pollutant in a receiving water required to protect humans from non-carcinogenic health effects and aquatic life from acute and chronic effects. These numbers are used to determine the necessity of developing a tier II value for a pollutant.
- (8) "Analytical detection limit" means the detection limit applied during the laboratory analysis for a specific measurement or set of measurements.

[Comment: Ohio EPA prefers reporting of any concentrations above the method detection limit, even if the concentrations are considered estimated. Federal regulations at 40 C.F.R. 122.21(e)(3) and 122.44(i)(1)(iv) require NPDES applicants and permittees to use sufficiently sensitive test methods when quantifying the presence of pollutants in a discharge as part of an application and for the analysis of pollutants under the permit. Applicants and permittees are required to use analytical methods that are capable of detecting and measuring the pollutants at, or below, the respective water quality criteria or permit limits. The regulations address when a method is sufficiently sensitive.]

- (9) "Average criteria" means all numeric criteria and tier II values expressed on an average basis contained in Chapter 3745-1 of the Administrative Code.
- (10) "Background" means all pollutants that flow from waters into the water body segment for which a TMDL, or a PEL determined in the absence of a TMDL, is being developed unless a load allocation is established for that source.
- (11) "Bioaccumulation" means the net accumulation of a substance by an organism as a result of uptake from all environmental sources.
- (12) "Bioaccumulative chemical of concern" or "BCC" has the same meaning as in rule

3745-1-02 of the Administrative Code.

- (13) "Carcinogen" means a substance, for the purpose of calculating additivity, for which a cancer criterion exists as identified in or calculated pursuant to, Chapter 3745-1 of the Administrative Code.
- (14) "Conservative pollutant" means a persistent pollutant for which a TMDL, or a PEL determined in the absence of a TMDL, is being developed that is assumed to not decay or transform within the water body segment.
- (15) "Criteria" means numeric criteria and tier II values established pursuant to Chapter 3745-1 of the Administrative Code.
- (16) "Critical low depth for lakes" means the minimum depth reasonably expected for the lake at the discharge point based on historical records, release schedules, or other pertinent information.
- (17) "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.
- (18) "Design conditions" means the receiving water and effluent conditions applied in the determination of a TMDL, or a WLA in the absence of a TMDL, that represent the conditions most critical to protection of the applicable use designations. These conditions include, but are not limited to, stream design flow, effluent design flow, temperature, hardness, and pH.
- (19) "Dilution ratio" means the ratio of receiving water to effluent for a given volume of water.
- (20) "Director" means the director of Ohio environmental protection agency.
- (21) "Discharge port" means the final outlet for effluent in a discharge pipe. This terminology is usually associated with outfall structures with multiple outlets designed to mix effluent rapidly with the receiving water.
- (22) "Discharge" means the addition of any pollutant to waters of the state from a point source.
- (23) "Dissolved metal translator" or "DMT" means the ratio between the total recoverable and dissolved concentrations of a metal in a receiving water, discharge, or a mixture of both that is expected to occur under the design conditions applicable to that metal.
- (24) "Endangered or threatened species", see threatened or endangered species.
- (25) "Endangered Species Act" means Endangered Species Act, 16 U.S.C. sections 1531 to 1544, as amended through July 1, 2017.

[Comment: The Endangered Species Act can generally be found in public libraries, and can be viewed electronically online at <http://www.gpo.gov/fdsys> and purchased through: "U.S. Government Publishing Office Bookstore, 701 North Capital Street N.W., Washington, DC 20401."]

- (26) "Flowing receiving water" means a body of water that exhibits a primarily unidirectional flow at the point of discharge.
- (27) "Group X", see reasonable potential.
- (28) "HMQ", see stream design flow.
- (29) "IC25" means the inhibition concentration twenty-five; the toxicant concentration that would cause a twenty-five per cent reduction in a non-quantal biological measurement such as reproduction or growth in the test population (as opposed to lethality which is a quantal or "all-or-none" response).
- (30) "Inside mixing zone maximum criteria" means the criteria that cannot be exceeded within the mixing zone. It is identical to final acute value (FAV), as defined in Chapter 3745-1 of the Administrative Code.
- (31) "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.
- (32) "Lake Erie Lakewide Management Plan" or "Lake Erie LAMP" means the management plan to restore and protect the beneficial uses of lake Erie developed in accordance with the Great Lakes Water Quality Agreement as amended in 1987, and the Great Lakes Critical Programs Act of 1990, Pub. L. No. 101-596, 104 Stat. 3000 (Nov. 16, 1990). The geographic scope of the lake Erie LAMP includes the open lake waters, the near shore area, embayments, river mouths and the lake effect zone of lake Erie tributaries. This document is available on the internet at <https://www.epa.gov/greatlakes/lake-erie-lamps>.
- (33) "LC50", for whole effluent toxicity tests, means the median lethal concentration; the per cent by volume effluent concentration that kills fifty per cent of exposed organisms during a specified exposure period.
- (34) "Lowest observed effect concentration" or "LOEC" means the lowest measured concentration (expressed as a per cent by volume) of an effluent or a toxicant that causes a statistically significant effect on a test organism during a specified exposure period.
- (35) "Load allocation" or "LA" is the portion of a receiving water's loading capacity that is attributed to one of its existing or future nonpoint sources.
- (36) "Loading capacity" is the greatest loading of a pollutant that a water body can receive without violating water quality standards under specific flow conditions; also referred to as assimilative capacity.
- (37) "Maximum criteria" means all numeric criteria and tier II values expressed as maximum pursuant to Chapter 3745-1 of the Administrative Code.
- (38) "Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels" means "Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels, U.S. EPA 821R96011, 1996". This document is available on the

internet at [http://www3.epa.gov/caddis/pdf/Metals\\_Sampling\\_EPA\\_method\\_1669.pdf](http://www3.epa.gov/caddis/pdf/Metals_Sampling_EPA_method_1669.pdf).

- (39) "Method detection limit" means the minimum measured concentration of a substance that can be reported with ninety-nine per cent confidence that the measured concentration is distinguishable from method blank results.
- (40) "Mixing zone" means an area of a water body contiguous to a 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 and not as a place where wastes are treated.
- (41) "Natural conditions" mean those conditions that are measured outside the influence of human activities.
- (42) "New discharge", for the purposes of implementing the bioaccumulative chemical of concern provisions in this chapter, 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 NPDES 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), unless there is increased loadings of BCCs due to the collection of wastewater from a significant industrial user and, based on the industry's raw materials and processes, the wastewater is expected to have quantifiable concentrations of the BCC significantly above levels typically associated with domestic wastewater and non-industrial storm water. These and all other discharges of BCCs are defined as existing discharges.
- (43) "No observed effect concentration" or "NOEC" means the highest tested concentration (expressed as a per cent by volume) of an effluent or a toxicant that causes no statistically significant observed effects on a test organism during a specified exposure period.
- (44) "Non-flowing waters" means water bodies that do not exhibit a natural unidirectional flow at the point of discharge.
- (45) "Nonpoint source" means any source of pollutants other than those defined or designated as point sources.



- (46) "Ohio river drainage basin" means all the streams, rivers, lakes, and other bodies of water within the drainage basin of the Ohio river.
- (47) "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.
- (48) "Pollutant" means sewage, industrial waste, or other waste as defined by divisions (B) to (D) of section 6111.01 of the Revised Code.
- (49) "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.
- (50) "Practical quantification level" or "PQL" means a concentration of a pollutant that is five times the method detection limit for the most sensitive available analytical procedure currently approved under 40 C.F.R. 136 for a pollutant, unless the director, by rules adopted in accordance with Chapter 119. of the Revised Code, establishes a different practical quantification level for the pollutant that is consistent with, and no more stringent than, the appropriate national consensus standard or other generally accepted standard.
- (51) "Preliminary effluent limit" or "PEL" means the most stringent applicable WLA expressed as both an average and a maximum. The average PEL is the lowest WLA to maintain chronic criteria and the maximum PEL is the lowest WLA to maintain acute criteria.
- (52) "Projected effluent quality" or "PEQ" means the estimated level of a pollutant in an effluent.
- (53) "Publicly owned treatment works" or "POTW" means any device or system used in the treatment (including recycling and reclamation) of domestic sewage or industrial waste of a liquid nature that is owned by a municipality, county, or state entity or any public body created under state law that has authority over disposal of sewage.
- (54) "Ranked ninety-fifth percentile" means the data value in a set of data that is greater than ninety-five per cent of the other data values as determined by ranking the data values from lowest to highest.
- (55) "Reasonable potential" means the likelihood of a pollutant to cause or contribute to an excursion of a water quality standard. For chemical-specific determinations, a grouping system for assessing whether to establish WQBELs as limits in NPDES permits consists of five categories that rank the reasonable potential.
- (a) "Group one" pollutants have no applicable criteria and the director has determined that data are insufficient to calculate criteria or values. The reasonable potential for pollutants in this group cannot be determined.

- (b) "Group two" pollutants have little potential based on water quality data to cause or contribute to a water quality excursion; permit requirements may not be warranted based solely on water quality considerations.
  - (c) "Group three" pollutants have some potential based on water quality data to cause or contribute to a water quality excursion; permit requirements may not be warranted based solely on water quality considerations.
  - (d) "Group four" pollutants have significant potential based on water quality data to cause or contribute to a water quality excursion; permit monitoring requirements are generally warranted based solely on water quality considerations.
  - (e) "Group five" pollutants have the highest potential based on water quality data to cause or contribute to a water quality excursion; permit limitations are generally warranted based solely on water quality considerations.
- (56) "Receiving water" means the water body into which point and nonpoint sources flow.
- (57) "Remedial action plan" or "RAP" means a management plan to restore and protect beneficial uses in the Great Lakes areas of concern. The areas of concern were identified by state and federal government agencies with the international joint commission as the most polluted sites around the Great Lakes. A RAP is prepared in accordance with the Great Lakes Water Quality Agreement as amended in 1987, and the Great Lakes Critical Programs Act of 1990, Public Law Number 101-596, 104 Stat. 3000 (Nov. 16, 1990). A RAP is prepared from a broad ecosystem perspective and with considerable public involvement.
- (58) "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 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)(58)(a) to

(B)(58)(f) of this rule, but which themselves may not be representative.

- (59) "Stream design flow" means the flow in a receiving water upstream from a discharge or nonpoint source that represents the flow conditions that are critical for protection of an aquatic life, human health, wildlife, or agricultural water supply use. Stream design flows may be calculated using annual or seasonal data; where seasonal data are appropriate, the applicable months are specified. The following statistical quantities based on stream flow data are used as stream design flows for various use designations in accordance with the rules of this chapter:
- (a) "1Q10" or "one-day, ten-year low flow" means the lowest one-day average flow expected to occur once every ten years.
  - (b) "7Q10" or "seven-day, ten-year low flow" means the lowest seven-consecutive-day average flow expected to occur once every ten years.
  - (c) "30Q10" or "thirty-day, ten-year low flow" means the lowest thirty-consecutive-day average flow expected to occur once every ten years.
  - (d) "90Q10" or "ninety-day, ten-year low flow" means the lowest ninety-consecutive-day average flow expected to occur once every ten years.
  - (e) "HMQ" or "harmonic mean flow" is calculated as the reciprocal of the arithmetic mean of the reciprocals of the individual daily flows. The HMQ is determined from a continuous record of daily average flow measurements.
- (60) "Technical Support Document for Water Quality-based Toxics Control" means "Technical Support Document for Water Quality-based Toxics Control, U.S. EPA 505/2-90-001, 1991." This document is available on the internet at <http://www3.epa.gov/npdes/pubs/owm0264.pdf>.
- (61) "The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion" means "The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion, U.S. EPA 823-B-96-007, 1996." This document is available on the internet at [http://www3.epa.gov/npdes/pubs/metals\\_translator.pdf](http://www3.epa.gov/npdes/pubs/metals_translator.pdf).
- (62) "Threatened or endangered species" or "endangered or threatened species" mean those species of the state's biota that 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.
- (63) "Total maximum daily load" or "TMDL" means the sum of the existing or projected point source, nonpoint source, and background loads for a pollutant to a specified watershed, water body, or water body segment. A TMDL sets and allocates the maximum amount of a pollutant that may be introduced into the water and still ensures attainment and maintenance

of water quality standards.

- (64) "Waste heat discharge" means a point source discharge through which excess heat is discharged into the surface waters of the state.
- (65) "Wasteload allocation" or "WLA" means the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. In the absence of a TMDL or TMDL assessment and remediation plan, a WLA is the allocation for an individual point source that ensures that the level of water quality to be achieved by the point source is derived from and complies with all applicable water quality standards.
- (66) "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, regardless of the depth of the strata in which underground water is located, 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.
- (67) "Water quality based effluent limit" or "WQBEL" means an effluent limitation determined on the basis of water quality standards set forth in Chapter 3745-1 of the Administrative Code or wasteload allocation procedures contained in this chapter.
- (68) "Water quality standards" means the standards set forth in Chapter 3745-1 of the Administrative Code.
- (69) "Wet weather point source" means any discernible, confined and discrete conveyance from which pollutants are, or may be, discharged as the result of a wet weather event. Discharges from wet weather point sources include only: discharges of storm water from a municipal separate storm sewer as defined in 40 C.F.R. 122.26 (b)(8); storm water discharges associated with industrial activity as defined in 40 C.F.R. 122.26 (b)(14); discharges of storm water and sanitary wastewaters (domestic, commercial, and industrial) from a combined sewer overflow; or any other storm water discharge for which a permit is required under section 402 (p) of the act. All storm water discharges associated with industrial activity that are mixed with process wastewater shall not be considered a wet weather point source.
- (70) "Whole effluent toxicity" or "WET" means the aggregate toxic effect of an effluent measured directly by a toxicity test where the test results are based on acute (lethal) or chronic (lethal and sublethal) endpoints.
- (71) As used in this chapter "40 C.F.R." means Title 40 of the Code of Federal Regulations effective July 1, 2017 and "50 C.F.R." means Title 50 of the Code of Federal Regulations effective October 1, 2017.

[Comment: The Code of Federal Regulations can generally be found in public libraries, and can be viewed electronically online at <http://www.gpo.gov/fdsys/> and purchased through: "U.S. Government Publishing Office Bookstore, 701 North Capital Street N.W.,

Washington, DC 20401."]

Effective:	3/1/2018
Five Year Review (FYR) Dates:	11/15/2017 and 03/01/2023
Promulgated Under:	119.03
Statutory Authority:	6111.03, 6111.12
Rule Amplifies:	6111.12
Prior Effective Dates:	10/31/1997, 12/20/2002, 6/7/2011

**3745-2-03 Application of biological survey data to development of water quality-based effluent limitations.**

(A) Applicability.

The provisions of this rule apply to waterbodies designated warmwater habitat, exceptional warmwater habitat and modified warmwater habitat. When the director has established that a pollutant in a point source discharge from an existing source has the reasonable potential to cause or contribute to excursions above a water quality criterion for aquatic life protection using the procedures established elsewhere in this chapter, the director may take into account biological survey data when setting the effluent limits for that pollutant where all of the following are met:

- (1) Biological survey data exist that are capable of assessing the attainment of the aquatic life use in the area affected by the permittee's effluent.
  - (2) The biological survey data are deemed credible when collected by a level 3 QDC in accordance with level 3 methods under an approved "Level 3 Project Study Plan" described in rule 3745-4-06 of the Administrative Code. Sampling methods descriptions are contained in "Biological Criteria for the Protection of Aquatic Life: Volume III. Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities" and the description and derivation of indices and ecoregions are contained in "Biological Criteria for the Protection of Aquatic Life: Volume II, Users Manual for Biological Field Assessment of Ohio Surface Waters" cited in paragraph (B) of rule 3745-1-03 of the Administrative Code.
  - (3) The biological survey data are collected during a time within the seasonal index period that is representative of the permittee's influence on aquatic life.
  - (4) Bioaccumulative pollutants will be limited by their most stringent applicability for aquatic life or human and wildlife health per rules 3745-1-42 and 3745-1-43 of the Administrative Code.
  - (5) In the lake Erie basin, the pollutant is listed in table G-1 in rule 3745-33-05 of the Administrative Code.
- (B) If biological survey data demonstrate attainment of all of the biological criteria applicable to a water body and initial wasteload allocation calculations done according to the procedures elsewhere in this chapter produce more stringent water quality-based effluent limits compared to those in effect at the time of the biological survey, the director may re-assess the modeling techniques, exposure assumptions and other related assumptions used for the initial wasteload allocation calculations and make adjustments for the derivation of alternate water quality-based effluent limits. All alternate wasteload allocations calculated after the consideration of biological survey data shall ensure that the final permit conditions will be protective of the aquatic life use, consistent with 40 CFR 122.44(d). In making decisions on whether setting alternate limits under this provision is appropriate and what the alternate limits will be, the director will consider the following:

- (1) Effluent PEQ values for the period represented by the biological assessment data.
  - (2) Current effluent flow data and the design flow data used in the initial wasteload allocation.
  - (3) Credible information about adverse impacts to mussels or endangered species.
  - (4) Whether pollutants in the discharge are causing or contributing to an exceedance of narrative toxicity WQS in accordance with the procedures in rule 3745-33-07 of the Administrative Code.
  - (5) The factors specified in division (J)(3) of section 6111.03 of the Revised Code.
- (C) If biological survey data indicate that the biological criteria applicable to a water body are not attained, the director will develop water quality-based effluent limits using the applicable protocols in Chapter 3745-2 of the Administrative Code.
- (D) The director may require studies to periodically monitor the receiving water to document the aquatic life attainment status.
- (E) In addition to the provisions stated in paragraphs (B) and (C) of this rule, no additional regulatory controls to reduce a pollutant responsible for non-attainment of biological criteria will be imposed on point sources that are meeting the criteria for that pollutant unless all the following are met:
- (1) The point sources are shown to be a primary cause of the non-attainment of the biological criteria, based on an assessment of annual or seasonal pollutant dynamics in the receiving water(s).
  - (2) The application of additional or alternate treatment or technology can reasonably be expected to lead to attainment of the designated use.
  - (3) The director had given due consideration to the factors specified in division (J)(3) of section 6111.03 of the Revised Code.
- (F) Nothing in this rule prevents the director from imposing any of the following:
- (1) Water quality-based effluent limits developed using applicable protocols described in this chapter of the Administrative Code.
  - (2) Regulatory controls on point sources for pollutants that do not have chemical-specific aquatic life criteria after consideration of the association between that pollutant and applicable biological indicators.
  - (3) Regulatory controls on point sources to meet non-aquatic life use water quality criteria.

Replaces: 3745-1-07  
Effective: 4/4/2024  
Five Year Review (FYR) Dates: 04/04/2029

CERTIFIED ELECTRONICALLY  
Certification

01/04/2024  
Date

Promulgated Under: 119.03  
Statutory Authority: 6111.041  
Rule Amplifies: 6111.041  
Prior Effective Dates: 02/14/1978, 04/04/1985, 08/19/1985, 04/30/1987,  
05/01/1990, 04/26/1997, 10/13/1997, 07/31/1998,  
07/31/1999, 02/22/2002, 12/30/2002, 03/15/2010,  
01/04/2016, 02/06/2017



**3745-2-04 Determinations preliminary to development of water quality-based effluent limitations.**

[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 3745-2-02 of the Administrative Code.]

- (A) For each discharge that may require the development of water quality-based effluent limitations (WQBELs), Ohio EPA shall develop wasteload allocations (WLAs) for pollutants if any of the following apply:
- (1) The maximum projected effluent quality (PEQ) determined for that discharge and pollutant is greater than or equal to twenty-five per cent of the smallest of the applicable maximum criteria, where the maximum PEQ is determined in accordance with paragraph (D) of this rule and the criteria are determined in accordance with paragraph (E) of this rule.
  - (2) The average PEQ determined for that discharge and pollutant is greater than or equal to twenty-five per cent of the smallest of the applicable average criteria, where the average PEQ is determined in accordance with paragraph (D) of this rule and the criteria are determined in accordance with paragraph (E) of this rule.
  - (3) The discharge is considered by Ohio EPA to be interactive with one or more other discharges to the receiving water for this pollutant and one or more of the discharges will require WLAs for this pollutant based on conditions other than this condition.
  - (4) The pollutant has the potential to threaten or impair the designated use of the receiving waters and is known or expected to occur in the discharge during the applicable permit period.
  - (5) A WQBEL is required to meet other federal, state, or local regulations or as may be necessary to implement surface water or NPDES permit programs.
- (B) The following exceptions apply to paragraph (A) of this rule:
- (1) If all available effluent data for a pollutant are below the analytical detection levels applied to that data, then a maximum PEQ and an average PEQ cannot be calculated for that pollutant and a determination of WLAs will not be required unless one or more of the conditions in paragraphs (A)(3) to (A)(5) of this rule apply.
  - (2) If Ohio EPA determines that a WLA is required for a pollutant based on any one of the conditions listed in paragraph (A) of this rule, Ohio EPA is not required to evaluate the applicability of the other conditions.
  - (3) For pollutants that include both dissolved and total recoverable numeric aquatic life

criteria in Chapter 3745-1 of the Administrative Code, Ohio EPA may use the total recoverable criteria alone to determine the applicability of conditions in paragraphs (A)(1) and (A)(2) of this rule.

(C) For discharges in the lake Erie basin: For pollutants that require WLA determination based on paragraph (A)(4) or (A)(5) of this rule, but do not have established numeric criteria in Chapter 3745-1 of the Administrative Code, Ohio EPA shall evaluate available data to determine applicable numeric criteria. Ohio EPA shall also take the following actions:

- (1) If available data are insufficient to determine numeric criteria and the pollutant is included in table 6 of the "Final Water Quality Guidance for the Great Lakes System" (40 C.F.R. 132), Ohio EPA shall use all available and relevant information to estimate ambient screening values that will protect humans from health effects other than cancer, and aquatic life from acute and chronic effects.
- (2) If the maximum PEQ is greater than or equal to twenty-five per cent of the ambient screening value for protection of aquatic life from acute effects, or the average PEQ is greater than or equal to twenty-five per cent of the lowest of the ambient screening values for protection of human health or aquatic life from chronic effects, Ohio EPA shall develop WLAs based upon the ambient screening values that are consistent with rule 3745-2-05 of the Administrative Code.
- (3) In accordance with paragraph (B)(6) of rule 3745-2-06 of the Administrative Code, Ohio EPA shall use the WLAs based on ambient screening values to determine if data must be generated to develop numeric criteria for that pollutant.
- (4) Ohio EPA shall not use the WLAs based on ambient screening values to develop WQBELs.

(D) For each pollutant for which discharge-specific effluent data is available and one or more data values equal or exceed the analytical detection levels applied to that data, Ohio EPA shall determine the maximum PEQ and the average PEQ to meet the following requirements, unless otherwise exempt from determination by paragraph (B) of this rule.

- (1) The discharge-specific effluent monitoring data shall be selected to best represent the magnitude and variability of that pollutant in the discharge as projected for the applicable period of the permit.
  - (a) The most recent five years of data shall be used unless an alternate period of record better represents the projected effluent quality. Such alternative periods of record may include, but are not limited to, shorter time periods that reflect changes in discharge characteristics that result from changes in manufacturing processes or wastewater treatment systems or their operation.
  - (b) Extreme outliers and other data anomalies that result from collection, analysis, or recording errors or non-repeatable plant operation or discharge conditions may be eliminated from the data.
  - (c) The data shall be based on independent grab or twenty-four hour composite effluent

samples. If such data are unavailable, other discharge-specific effluent data may be used if the discharger demonstrates that the data properly represent the long-term daily variability of the pollutant in the effluent, or Ohio EPA can adjust the data by a scientifically defensible procedure to represent independent daily values.

- (d) If available data do not adequately represent the projected magnitude and variability of the pollutant, Ohio EPA may adjust the available data or the PEQ calculation procedures to approximate the projected changes in effluent quality provided these adjustments are scientifically defensible.
  - (2) The maximum PEQ shall be determined as the ninety-fifth percentile of the projected population of daily values of the discharge-specific effluent monitoring data using a scientifically defensible statistical method that accounts for and captures the long-term daily variability of the effluent quality, accounts for limitations associated with sparse data sets, and assumes a log-normal distribution of the discharge-specific effluent data (unless another distribution can be demonstrated to be more appropriate).
  - (3) The average PEQ shall be determined as the ninety-fifth percentile of the projected population of monthly averages of the discharge-specific effluent monitoring data using a scientifically defensible statistical method that accounts for and captures the long-term variability of the monthly average effluent quality, accounts for limitations associated with sparse data sets, and assumes a log-normal distribution of the discharge-specific effluent data (unless another distribution can be demonstrated to be more appropriate).
  - (4) For pollutants with numeric criteria representing the sum of two or more isomers or metabolites (such as but not limited to halomethanes, polyaromatic hydrocarbons, and DDT), the PEQ may be estimated as the sum of the PEQs determined for the individual isomers or metabolites.
  - (5) In the absence of reliable effluent data for a new or expanded discharge, the requested discharge level will be used as the PEQ for use in reasonable potential determinations.
- (E) The numeric water quality criteria applicable to the receiving waters are determined in Chapter 3745-1 of the Administrative Code.
- (1) For numeric criteria that vary with water hardness, Ohio EPA shall calculate the applicable numeric criteria based on a water hardness concentration that meets the following:
    - (a) If water hardness data are available that represent the concentration in the receiving water downstream of the mixing zone under the applicable design conditions, as follows:
      - (i) The median of the water hardness values shall be used if ten or more values are available.
      - (ii) The arithmetic mean of the water hardness values shall be used if less than ten values are available.

- (b) If water hardness data are not available that represent the concentration in the receiving water downstream of the mixing zone under the applicable design conditions, the annual twenty-fifth percentile of water hardness data considered by Ohio EPA to be representative of the natural background conditions for that receiving water shall be used.
  - (c) If discharge-specific data are available that adequately represent the projected water hardness of the effluent over the applicable permit period, a water hardness concentration based on the effluent data and determined in accordance with paragraph (E)(1)(a) of this rule may be used to determine the inside mixing zone maximum (IMZM) numeric criterion applicable to that discharge provided that an area of initial mixing (AIM) is not applied to this discharge.
  - (d) If an AIM is applied to the discharge, a concentration representing the water hardness at the edge of the AIM may be used to determine IMZM numeric criteria applicable to that discharge if the discharge meets all of the following conditions:
    - (i) The concentration is based on receiving water and discharge water hardness data that meet the conditions specified in paragraphs (E)(1)(a) and (E)(1)(c) of this rule, respectively.
    - (ii) The concentration is calculated based on the dilution applicable at the edge of the AIM.
    - (iii) Other factors that may affect water hardness are accounted for, such as, but not limited to, effluent and receiving water variability and chemical interactions.
- (2) For numeric criteria that vary with pH (other than for ammonia), Ohio EPA shall calculate the applicable numeric criteria based on a pH that meets the following:
- (a) If pH data are available that represent the long term daily variation in the receiving water downstream of the mixing zone under the applicable design conditions, the median of the pH values shall be used.
  - (b) If pH data are not available that represent the long term daily variation in the receiving water downstream of the mixing zone under the applicable design conditions, the annual twenty-fifth percentile or seventy-fifth percentile (whichever value results in the more stringent numeric criterion) of pH data considered by Ohio EPA to be representative of the natural background conditions for that receiving water shall be used.
  - (c) If discharge-specific data is available that adequately represents the projected pH of the effluent over the applicable permit period, the median pH based on the effluent data may be used to determine the IMZM numeric criterion applicable to that discharge provided that an AIM is not applied to this discharge.
  - (d) If an AIM is applied to the discharge, a value representing the pH in the receiving water at the edge of the AIM may be used to determine IMZM numeric criteria

applicable to that discharge if it meets the following conditions:

- (i) The pH is based on receiving water and discharge water pH data that meet the conditions specified in paragraphs (E)(2)(a) and (E)(2)(c) of this rule, respectively.
  - (ii) The pH is calculated based on the dilution applicable at the edge of the AIM.
  - (iii) Other factors that may affect pH are accounted for, such as, but not limited to, effluent and receiving water variability and chemical interactions.
- (3) For ammonia, unless alternative periods are found to be necessary or appropriate in order to maintain water quality criteria, Ohio EPA shall determine numeric criteria for two seasonal periods, summer and winter. Ohio EPA shall calculate numeric criteria for ammonia based on temperature and pH values that meet the following:
  - (a) Temperature and pH shall be based on data collected during the following periods:
    - (i) June through September for the summer season.
    - (ii) December through February for the winter season.
    - (iii) The period of data that best represents the season for alternative seasonal periods.
  - (b) For each applicable season, temperature and pH statistics shall be determined based on the available ambient data that best represents the long-term daily variation in the receiving water downstream of the mixing zone. The following statistics shall be used to determine the applicable ammonia criteria:
    - (i) Seventy-fifth percentile for temperature.
    - (ii) Seventy-fifth percentile for pH.
  - (c) If data are not available for the receiving water, data from another water body may be used if it can be demonstrated that the other water body has similar temperature and pH related characteristics. If data are not available for a similar water body, data considered by Ohio EPA to be representative of the natural background conditions for that receiving water may be used.
- (4) Other methods for determining the applicable water hardness, pH, and temperature may be allowed by Ohio EPA provided the methods are scientifically defensible and can be demonstrated to maintain all applicable water quality criteria.
- (5) For WLA determinations based on probabilistic analysis, as allowed by rule 3745-2-05 of the Administrative Code, Ohio EPA shall consider the numeric water quality criteria applicable to the receiving water to be maintained if the allowable duration and frequency of exceedance recommended in the U.S. EPA "Technical Support Document

for Water Quality-based Toxics Control" are met. Ohio EPA may allow an alternative duration and frequency of exceedance if the duration and frequency are scientifically defensible and can be demonstrated to provide sufficient protection of the designated water quality uses of the receiving water.

- (F) For metals that have both dissolved and total recoverable aquatic life criteria in Chapter 3745-1 of the Administrative Code and for which paragraph (A) of this rule applies, Ohio EPA shall determine the appropriate criteria applicable to determining WLAs using the following conditions:
- (1) Except for hexavalent chromium, Ohio EPA shall convert the dissolved aquatic life criteria to effective total recoverable criteria by multiplying the applicable dissolved criteria by the dissolved metal translator (DMT) applicable to that metal, receiving water, and discharge, as defined in paragraphs (F)(4) to (F)(8) of this rule.
  - (2) In the absence of an applicable DMT, Ohio EPA shall apply the total recoverable aquatic life criteria to determine WLAs for that metal as provided in Chapter 3745-1 of the Administrative Code and determined in accordance with paragraph (E) of this rule.
  - (3) For hexavalent chromium, Ohio EPA shall apply the dissolved aquatic life criteria to develop and express WLAs in dissolved form.
  - (4) For acute and chronic aquatic life criteria, an applicable DMT shall represent the receiving waters downstream of the chronic mixing zone under design conditions.
  - (5) For the IMZM criterion, the DMT applicable to the acute aquatic life criterion shall be applied, with the following exceptions:
    - (a) When the effluent is known or suspected to have a DMT significantly lower than that applied to the acute aquatic life criterion, either of the following apply:
      - (i) An effluent DMT may be determined and applied if it meets the protocol provided in paragraph (G) of this rule.
      - (ii) If an applicable effluent DMT is not determined, the total recoverable IMZM criteria shall be applied in accordance with paragraph (F)(2) of this rule.
    - (b) When the effluent is known to have a DMT higher than that applied to the acute aquatic life criterion, an alternative DMT of up to the effluent DMT may be applied if the discharger can demonstrate that it maintains all applicable dissolved aquatic life criteria in the receiving water and the effluent DMT is determined in accordance with paragraph (G) of this rule.
  - (6) A discharge-specific DMT for a metal may be determined by the discharger or Ohio EPA in accordance with paragraph (G) of this rule. The discharge-specific DMT shall be applied by Ohio EPA to determine the effective total recoverable criteria applicable to that metal.

- (7) Ohio EPA may determine a DMT for a specific water body segment. If a water-body-segment-specific DMT is available and applicable to the discharge and receiving water and an acceptable discharge-specific DMT is not available, Ohio EPA shall apply that water-body-segment-specific DMT to determine the effective total recoverable criteria applicable to that metal.
  - (8) Ohio EPA may determine a DMT applicable to water bodies in a specific region of the state of Ohio. If a region-specific DMT is available and applicable to the discharge and receiving water and an acceptable discharge-specific or water-body-segment-specific DMT is not available, Ohio EPA shall apply the region-specific DMT in determining effective total recoverable criteria applicable to that metal.
- (G) A discharge-specific DMT shall be determined in accordance with the U.S. EPA document, "The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion" (translator document) except as follows:
- (1) Only those procedures in the translator document which are intended for determination of site-specific translators and are based on direct measurement of dissolved and total recoverable metal concentrations may be applied in the determination of discharge-specific DMTs.
  - (2) The discharge-specific DMT shall be determined to represent the receiving water downstream of the applicable mixing zone under the more restrictive of the following conditions:
    - (a) The stream design flow and other receiving water and effluent conditions applicable to the determination of WLAs for aquatic life criteria pursuant to rule 3745-2-05 of the Administrative Code and paragraph (E) of this rule.
    - (b) Other receiving water or effluent conditions that are determined by Ohio EPA to be more critical in regard to the impact of dissolved metals on aquatic life.
  - (3) The discharge-specific DMT shall represent the ratio of the total recoverable concentration of a metal to the dissolved concentration. An individual DMT measurement shall be determined as the ratio of the total recoverable concentration of a metal in a water sample to the dissolved concentration of that metal in the same water sample or a separate sample collected at the same time and location.
  - (4) Clean sampling and analytical procedures in accordance with the U.S. EPA document "Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels" shall be applied in the collection and analysis of the metals concentrations used to determine a DMT measurement. Alternative sampling and analytical procedures may be applied if the procedures can be shown to provide sufficient protection from contamination, such that any contamination of the samples that may occur will not be significant relative to the DMT measurement.
  - (5) At a minimum, the following measurements shall also be made at the same time and

location as each of the DMT measurements:

- (a) Total suspended solids concentration.
  - (b) Water hardness.
  - (c) Water pH.
  - (d) Water temperature.
  - (e) Receiving water flow and effluent flow.
- (6) If either or both of the total recoverable and dissolved concentrations on which a DMT measurement is based are less than the applicable practical quantification level (PQL), then the DMT measurement shall not be used in determining the discharge-specific DMT unless the inaccuracies associated with concentrations less than PQL can be demonstrated to be insignificant or are accounted for through application of scientifically defensible conservative measures. Additionally, if either or both of the total recoverable and dissolved concentrations on which a DMT measurement is based are less than the applicable analytical detection level, the following requirements apply:
- (a) If the total recoverable concentration, or both the total recoverable and dissolved concentrations, are below the applicable detection level, then the DMT measurement shall not be used in determining the discharge-specific DMT.
  - (b) If only the dissolved concentration is below the applicable detection level, then the DMT measurement may be used in determining the discharge-specific DMT if the dissolved concentration is assumed to equal a concentration no less than the applicable analytical detection level.
- (7) All DMT measurements applicable to the discharge and receiving water shall be used in determining the discharge-specific DMT, unless the DMT measurements are eliminated in accordance with paragraph (G)(6) of this rule or the DMT measurements can be demonstrated to be inaccurate or unrepresentative of the conditions applicable under paragraph (G)(2) of this rule. A DMT measurement less than one, where the observed dissolved metal concentration exceeds the total recoverable concentration, shall not be eliminated unless the individual concentration measurements can otherwise be demonstrated to be inaccurate.
- (8) If the DMT measurements were collected during receiving water and effluent conditions approximating the conditions applicable under paragraph (G)(2) of this rule, the following requirements apply to the determination of a discharge-specific DMT.
- (a) The discharge-specific DMT shall be calculated as the geometric mean of the measured translators if all of the following conditions are met:
    - (i) At least ten DMT measurements are available and used in that calculation.
    - (ii) All DMT measurements used in the calculation adequately represent the



conditions applicable under paragraph (G)(2) of this rule.

- (iii) The observed variation of the DMT measurements about the geometric mean will not result in significant exceedances of the applicable aquatic life criteria if the geometric mean is applied as the discharge-specific DMT.
  - (b) If the conditions in paragraph (G)(8)(a) of this rule are not met, but sufficient data are available to accurately estimate the variability of DMT measurements, the discharge-specific DMT shall be calculated by a scientifically defensible method that accounts for the inaccuracies associated with small data sets or data that may not represent the conditions applicable under paragraph (G)(2) of this rule. Such methods may include, but are not limited to, selection of a statistic that produces a DMT sufficiently lower than the geometric mean in order to provide reasonable assurance that possible inaccuracies in the discharge-specific DMT will not result in exceedance of applicable aquatic life criteria.
- (9) If DMT measurements were collected over a range of receiving water and effluent conditions, including conditions outside those applicable under paragraph (G)(2) of this rule, a scientifically defensible method shall be applied to determine the mathematical relationships between the DMT measurements and the other measured factors, separately and in combination, including but not limited to stream flow and total suspended solids concentrations. Scientifically defensible methods shall also be used to determine the values for each measured factor that will occur during the receiving water and effluent conditions applicable under paragraph (G)(2) of this rule. The discharge-specific DMT shall be determined based on the most significant of these relationships and values to represent the conditions applicable under paragraph (G)(2) of this rule. These methods shall account for any inaccuracies or uncertainties associated with the data or the derived relationships so as to provide reasonable assurance that possible inaccuracies in the discharge-specific DMT will not result in exceedance of applicable aquatic life criteria.
- (10) Before conducting a discharge-specific DMT study, the discharger may complete a plan of study in accordance with Chapter 5 of the translator document, as referenced in paragraph (G) of this rule, and submit the study to Ohio EPA for review and comment.
- (11) After completion of the discharge-specific DMT study, the discharger shall submit a final report to Ohio EPA, including at a minimum the following information:
- (a) A description of the field activities and, as applicable, any variations from the plan of study.
  - (b) All data collected during the study.
  - (c) A discharge-specific DMT for each metal evaluated, calculated based on the study and in accordance with paragraph (G) of this rule.
  - (d) Descriptions and justifications for all analyses, calculations, and assumptions made in the determination of the discharge-specific DMT.

- (12) Each discharge-specific DMT calculated pursuant to the requirements of paragraph (G) of this rule shall be used in determination of WLAs for that discharge in accordance with paragraph (F) of this rule. If a discharge-specific DMT for a metal was not calculated in accordance with the requirements of paragraph (G) of this rule, Ohio EPA shall not apply that DMT in determination of WLAs, but may take one of the following actions:
- (a) Based on the discharge-specific DMT study and other available information, Ohio EPA may determine and apply a discharge-specific DMT for that metal, in accordance with this rule.
  - (b) Ohio EPA may allow the discharger to revise the study and discharge-specific DMT for that metal to meet the requirements of this rule and resubmit the final report.
- (13) All studies and reports required under paragraph (G) of this rule shall be in compliance with a schedule agreed upon between Ohio EPA and the discharger such that the discharge-based DMTs will be completed prior to the scheduled determination of WLAs for that discharge.
- (14) If sampling is required as a condition of an NPDES permit to verify the continued validity of an applied discharge-specific DMT for a metal (in accordance with paragraph (C) of rule 3745-33-05 of the Administrative Code), the following requirements shall apply:
- (a) At least one DMT measurement shall be made during the permit period that, in Ohio EPA's determination, adequately represents the receiving water downstream of the mixing zone for the discharge under the applicable design conditions and meets the requirements of paragraph (G) of this rule.
  - (b) The DMT measurements shall be collected in accordance with a schedule in the NPDES permit such that the results of the measurement will be available prior to the next scheduled determination of WLAs for that discharge.
- (15) If Ohio EPA determines, based on DMT measurements collected in accordance with paragraph (G)(14) of this rule, that a discharge-specific DMT is still valid, Ohio EPA may apply that discharge-specific DMT in determination of WLAs required for NPDES permit renewal for that discharge.
- (16) If Ohio EPA determines, based on DMT measurements collected in accordance with paragraph (G)(14) of this rule, that the applied discharge-specific DMT may no longer be valid for that discharge, Ohio EPA may take one of the following actions:
- (a) Ohio EPA may require the discharger to collect additional DMT measurements and redetermine an applicable discharge-specific DMT, in accordance with this rule. Data from the original discharge-specific DMT study may be included if the discharger demonstrates that the data are applicable.

- (b) Based on the new DMT measurements, the original DMT study, and other available information, Ohio EPA may determine an appropriate discharge-specific DMT in accordance with this rule.
- (c) Ohio EPA may apply a discharge-specific DMT determined under paragraph (G)(16)(a) or (G)(16)(b) of this rule to determine WLAs for that discharge as required for renewal or a modification of an NPDES permit.

Effective:	2/15/2019
Five Year Review (FYR) Dates:	11/14/2018 and 02/15/2024
Promulgated Under:	119.03
Statutory Authority:	6111.12, 6111.03
Rule Amplifies:	6111.12
Prior Effective Dates:	10/31/1997, 10/05/2007, 06/07/2011

**3745-2-05 Calculating wasteload allocations.**

[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 3745-2-02 of the Administrative Code.]

- (A) For discharges of toxic and carcinogenic pollutants to flowing receiving waters, a wasteload allocation (WLA) for a pollutant shall be calculated for each water quality criterion applicable in accordance with rule 3745-2-04 of the Administrative Code using the following mass balance equation:

$$[WQC(Q_{\text{eff}} + Q_{\text{up}}) - Q_{\text{up}}(WQ_{\text{up}})] / Q_{\text{eff}}$$

Where:

WQC = water quality criterion as established in rule 3745-2-04 of the Administrative Code.

$Q_{\text{eff}}$  = effluent flow as established in paragraph (A)(4) of this rule.

$Q_{\text{up}}$  = per cent of the stream design flow as established in paragraphs (A)(1) and (A)(2) of this rule.

$WQ_{\text{up}}$  = background water quality as established in paragraph (A)(3) of this rule.

Alternative modeling methods (including, but not limited to, continuous simulation or probabilistic analyses) may be used at the discretion of the director if they are demonstrated to be appropriate and protective of applicable water quality criteria.

- (1) The following stream design flows shall be used to determine WLAs for discharges to flowing receiving waters, unless otherwise specified in this rule.
- (a) 7Q10 for average aquatic life criteria (except for ammonia-nitrogen).
  - (b) 1Q10 for maximum aquatic life criteria (except for ammonia-nitrogen).
  - (c) HMQ for agricultural water supply, human health, and aesthetic criteria.
  - (d) 90Q10 for wildlife criteria.
  - (e) The per cent of stream design flow contained in paragraph (A)(2) of this rule shall be used in all WLAs, except as specifically provided by paragraph (A)(2)(f) of this rule. The per cent of stream design flow used for conducting WLAs to achieve maximum and average water quality criteria shall be the same, except as provided in paragraphs (A)(2)(d) and (A)(2)(e) of this rule.
  - (f) Stream design flows for streams that are impacted by reservoirs or other physical alterations which impact stream flow shall be determined on a case-by-case basis, taking into account relevant site-specific factors. Stream design flows for such

impacted stream segments shall be established at levels to ensure protection of designated uses.

- (g) Alternative flows may be used at the director's discretion if the flow is as protective as those listed in this paragraph.

(2) The stream/discharge flow ratio (SDR) is the ratio of annual 7Q10 to effluent design flow.

- (a) If the annual 7Q10 is less than or equal to 1.0 cubic feet per second, or if the SDR is equal to or less than 10.0, one hundred per cent of the applicable stream design flow shall be used in the WLA.
- (b) If the SDR is equal to or greater than 252.0, the WLA shall be calculated using twenty-five per cent of the applicable stream design flow.
- (c) If the SDR is greater than 10.0 but less than 252.0, the WLA shall be calculated using the per cent of the applicable stream design flow determined by the following equation:

$$\text{Per cent} = 103.1 - 0.31 (\text{SDR})$$

- (d) Exceptions for discharges to flowing streams in the lake Erie basin include all of the following:
  - (i) WLAs to maintain average criteria shall be calculated using twenty-five per cent of the applicable stream design flow.
  - (ii) WLAs to maintain maximum criteria shall be calculated using the SDR to determine the applicable percentage of the stream design flow, as established in paragraphs (A)(2)(a) to (A)(2)(c) of this rule.
  - (iii) No new discharges of bioaccumulative chemicals of concern (BCCs) shall be allowed a mixing zone after December 30, 2002.
  - (iv) For existing discharges of BCCs, mixing zones shall be phased out. No mixing zone shall be available after November 15, 2010, unless the discharger demonstrates to the satisfaction of the director, that a mixing zone is necessary for technical, economic, or water conservation reasons.
- (e) Exceptions for discharges to flowing streams in the Ohio river basin:
  - (i) No new discharges of bioaccumulative chemicals of concern (BCCs) shall be allowed a mixing zone after December 30, 2002.
  - (ii) For existing discharges of BCCs, mixing zones shall be phased out. No mixing zone shall be available after November 15, 2010, unless the discharger demonstrates to the satisfaction of the director, that a mixing zone is necessary for technical, economic, or water conservation reasons.

(f) Exceptions for direct discharges to the Ohio river. The following stream design flows and percentages of stream design flows shall be used for WLAs for direct discharges to the Ohio river:

(i) WLAs to maintain average aquatic life criteria shall use ten per cent of the 7Q10.

(ii) WLAs to maintain maximum aquatic life criteria shall use one per cent of the 7Q10.

(iii) WLAs for human health criteria for carcinogens, agricultural water supply criteria, and aesthetic criteria shall use ten per cent of the HMQ.

(iv) WLAs for human health criteria for non-carcinogens shall use one hundred per cent of the 7Q10.

(g) A mixing demonstration may be conducted to justify the use of alternate percentages of stream design flow, in accordance with rule 3745-1-06 of the Administrative Code.

(3) Background water quality shall be determined using the following methods.

(a) If representative ambient data are available, all of the following apply:

(i) The arithmetic mean shall be used if the number of observations is less than ten.

(ii) The median shall be used if the number of observations is greater than or equal to ten.

(iii) Values reported as less than the reported analytical detection level shall be replaced with one-half of the applied detection level in the calculation of the mean or median. If the analytical detection level for a pollutant is not reported and is not available, the analytical detection level for the most sensitive analytical method approved under 40 C.F.R. 136, or other analytical method detection level deemed acceptable by the director, shall be used.

(b) If all representative ambient data are below detection, both of the following apply:

(i) Zero shall be used as the background water quality if default mixing assumptions are being applied and if the pollutant is not reasonably suspected of causing or contributing to the impairment or threatening of the designated use in the receiving water. Background water quality may be determined as part of any study designed to increase the default mixing levels established in paragraph (A)(2) of this rule.

(ii) One-half of the reported analytical detection level for the pollutant or one-half of the lowest water quality criteria, whichever is lower, shall be used as the background water quality if the pollutant is reasonably suspected of causing or

contributing to the impairment or threatening of the designated use in the receiving water. Studies such as those listed in paragraph (A)(3)(b)(ii)(a) or (A)(3)(b)(ii)(b) of this rule may be substituted for the values of background water quality in this paragraph if Ohio EPA determines that the study is scientifically defensible.

- (a) The pollutant shall be quantified through additional monitoring of background water quality with more sensitive analytical methods.
    - (b) The pollutant shall be quantified by another method, such as caged fish or native fish data.
  - (c) If no representative ambient data are available, data considered by the director to be representative of the natural background conditions for that receiving water shall be used. Such data shall be evaluated in accordance with paragraphs (A)(3)(a) and (A)(3)(b) of this rule.
  - (d) If no representative ambient data are available and there is no other representative information available, background water quality shall be determined using the procedures in paragraph (A)(3)(b) of this rule. Any study designed to increase the effluent mixing levels established in paragraph (A)(2) of this rule shall include determination of background water quality.
  - (e) At the director's discretion, alternate statistical techniques to determine background water quality may be used if the techniques are demonstrated to be appropriate.
- (4) Effluent design flow. The effluent design flow used in the WLAs shall be any of the following:
- (a) The average design flow for publicly owned treatment works (POTW), unless the director reasonably believes that the actual effluent flow will differ significantly from the design flow during the life of the permit. In such a case, the effluent flow shall represent a reasonable estimate of the projected flow for the POTW during the applicable permit period.
  - (b) A reasonable measure of average wastewater flow for dischargers other than publicly owned treatment works. This flow shall represent a reasonable measure of actual production, projected to occur during the next NPDES permit period.
  - (c) The projected average design flow for proposed sources.
  - (d) If no effluent flow is available, the WLA will be calculated using not more than twenty-five per cent of the stream design flow.
- (5) WLA results shall not exceed the inside mixing zone maximum (IMZM) unless a mixing demonstration is completed in accordance with rule 3745-1-06 of the Administrative

Code that justifies an alternate value.

- (6) If the background water quality exceeds an applicable average criterion, the WLA for that criterion shall equal the applicable average criterion.
- (7) If the background water quality exceeds the maximum criterion, the WLA for that criterion shall equal the maximum criterion.
- (8) Multiple discharges. When it is necessary to consider multiple discharges in a WLA, the loading capacity may be distributed among discharges using a method considered appropriate by the director, based on site-specific considerations.
- (9) When determining a WLA for multiple discharges, the stream/discharge flow ratio shall be calculated as the total flow at the end of the modeled segment under 7Q10 design conditions minus all effluent flow, divided by the total effluent flow to the segment. This SDR shall then be used to calculate the applicable percentage of stream design flow, using the equation listed in paragraph (A)(2) of this rule. The same percentage of stream design flow shall be used for each discharge in the segment.

(B) WLAs for direct discharges to lakes.

- (1) WLAs to maintain average criteria for direct discharges to non-flowing receiving waters shall be determined using the following equation:

$$11(WQC) - 10(BACK)$$

Where:

WQC = water quality criterion as established in rule 3745-2-04 of the Administrative Code.

BACK = background water quality as established in paragraph (A)(3) of this rule.

- (2) Exceptions for bioaccumulative chemicals of concern (BCCs).
  - (a) No new discharges of BCCs shall be allowed a mixing zone after December 30, 2002.
  - (b) For existing discharges of BCCs, mixing zones shall be phased out. No mixing zone shall be available after November 15, 2010, unless the discharger demonstrates to the satisfaction of the director, that a mixing zone is necessary for technical, economic, or water conservation reasons.
- (3) WLAs for the maximum criteria shall be set equal to the IMZM. WLA results shall not exceed the IMZM unless a mixing demonstration is completed in accordance with rule 3745-1-06 of the Administrative Code that justifies an alternate value.
- (4) If the background water quality exceeds an applicable average criterion, the WLA for that criterion shall equal the applicable average criterion.



- (5) A mixing demonstration may be conducted in accordance with rule 3745-1-06 of the Administrative Code to justify a different quantity of receiving water in the WLA for average criteria or limits that exceed the IMZM.
- (6) At the director's discretion, alternate modeling methods may be used if they are demonstrated to be appropriate and protective of water quality criteria.

Effective:	3/1/2018
Five Year Review (FYR) Dates:	11/15/2017 and 03/01/2023
Promulgated Under:	119.03
Statutory Authority:	6111.03, 6111.12
Rule Amplifies:	6111.12
Prior Effective Dates:	10/31/1997, 12/20/2002, 12/1/2006, 6/7/2011

**3745-2-06 Application of preliminary effluent limitations.**

(A) General provisions.

- (1) The average preliminary effluent limitation (PEL) is the lowest wasteload allocation (WLA) based on chronic criteria, and the maximum PEL is the lowest WLA based on acute criteria, calculated pursuant to rule 3745-2-05 of the Administrative Code.
- (2) A water quality-based effluent limitation (WQBEL) or monitoring requirement for a pollutant shall be determined by the reasonable potential of that pollutant to cause or contribute to an excursion of any applicable water quality standard established in or developed under Chapter 3745-1 of the Administrative Code.
- (3) Except as provided in paragraph (C) of this rule and paragraph (A) of rule 3745-33-07 of the Administrative Code, the determination of reasonable potential shall be based on the comparison of the average or the maximum projected effluent quality (PEQ) to the average or the maximum PEL, respectively, and on other site-specific factors in accordance with paragraph (B) of this rule. This comparison will result in the assignment of the pollutant to a group with an associated water quality-based permit condition recommendation. Final permit conditions shall be established by Ohio EPA in accordance with rule 3745-33-07 of the Administrative Code.

(B) Pollutant assessment.

- (1) WQBELs shall be recommended for any group five pollutant. A pollutant shall be assigned to group five if any of the following conditions apply:
  - (a) The average PEQ is greater than or equal to the average PEL or the maximum PEQ is greater than or equal to the maximum PEL.
  - (b) The average or maximum PEQ is greater than or equal to seventy-five per cent of the average or maximum PEL, respectively, and any of the following conditions apply:
    - (i) The total load of a pollutant in the receiving water at a point downstream of the discharge is greater than or equal to seventy-five per cent of the loading capacity of the receiving water at that point, where, for the purpose of this determination:
      - (a) The total load of a pollutant is determined as the sum of the background load and the load associated with the PEL for that discharge. If multiple discharges were included in determination of the PEL, the load associated with the PEL for each upstream discharge shall also be added. Other upstream pollutant loads included in determination of the PEL shall also be included.



- (3) A tracking requirement in accordance with rule 3745-33-07 of the Administrative Code shall be recommended for any pollutant for which the average PEQ is more than seventy-five per cent of the average PEL or the maximum PEQ is more than seventy-five per cent of the maximum PEL and paragraph (B)(2) of this rule applies.
- (4) A monitoring requirement evaluation shall be recommended for any group three pollutant. A pollutant shall be assigned to group three if the average PEQ is less than fifty per cent of the average PEL and the maximum PEQ is less than fifty per cent of the maximum PEL and paragraph (B)(5) of this rule does not apply.
- (5) A monitoring requirement shall not be recommended for any group two pollutant. A pollutant shall be assigned to group two if a WLA was not required for one of the following reasons:
  - (a) Because the maximum PEQ is less than twenty-five per cent of the lowest applicable maximum criteria and the average PEQ is less than twenty-five per cent of the lowest applicable average criteria, in accordance with paragraphs (A)(1) and (A)(2) of rule 3745-2-04 of the Administrative Code.
  - (b) Because all available effluent data for the pollutant are below the analytical detection levels applied to that data, in accordance with paragraph (B)(1) of rule 3745-2-04 of the Administrative Code.
- (6) A pollutant shall be assigned to group one if a WLA could not be calculated because available data is insufficient to develop numeric criteria.
  - (a) For discharges in the lake Erie basin, if WLAs are determined based on ambient screening values as required by paragraph (C)(2) of rule 3745-2-04 of the Administrative Code, Ohio EPA shall generate or require the discharger to generate the data necessary to derive numeric criteria under the following conditions:
    - (i) If the maximum PEQ is greater than or equal to the WLA based on the ambient screening value to protect aquatic life from acute effects, data shall be generated to derive an acute aquatic life criterion for that pollutant.
    - (ii) If the average PEQ is greater than or equal to the WLA based on the ambient screening value to protect aquatic life from chronic effects, data shall be generated to derive a chronic aquatic life criterion for that pollutant.
    - (iii) If the average PEQ is greater than or equal to the WLA based on the ambient screening value to protect humans from health effects other than cancer, data shall be generated to derive a human health criterion for that pollutant.
  - (b) After data has been generated, as required by paragraph (B)(6)(a) of this rule, Ohio EPA shall develop numeric criteria for that pollutant in accordance with Chapter 3745-1 of the Administrative Code. Ohio EPA shall then reevaluate WLAs for that pollutant in accordance with Chapter 3745-2 of the Administrative Code.
  - (c) Ohio EPA shall establish any requirements for the discharger to collect the data

required by paragraph (B)(6)(a) of this rule in the discharger's permit, in accordance with Chapter 3745-33 of the Administrative Code.

- (7) Ohio EPA may exclude design parameters indicative of treatment plant performance from paragraphs (A) and (B) of this rule.
- (C) Pollutants in the intake water. The determination of reasonable potential of intake pollutants shall be made on a pollutant-specific and an outfall-specific basis. An intake pollutant is a pollutant that is present in waters of the state at the time it is withdrawn from such waters by a discharger or other facility (e.g., public water supply) supplying the discharger with intake water.
- (1) Paragraph (C) of this rule applies only in the absence of a TMDL implementation plan applicable to the discharge developed pursuant to rule 3745-2-12 of the Administrative Code. Paragraph (C) of this rule does not alter the conditions established in paragraph (A) of rule 3745-2-04 of the Administrative Code for determining the necessity of calculating WLAs.
- (2) The director may determine that an intake pollutant does not have reasonable potential where a discharger demonstrates to the director's satisfaction all of the following:
- (a) The discharger withdraws one hundred per cent of the intake water containing the pollutant from the same body of water into which the discharge is made.
  - (b) The discharger does not contribute any additional mass of the identified intake pollutant to its wastewater. In cases where the discharge is a combination of process wastewater and noncontact cooling water, and the process wastewater is limited separately from the noncontact cooling water, the director may consider application of paragraph (C) of this rule to the discharge of process wastewater and noncontact cooling water separately.
  - (c) The discharge does not alter the identified intake pollutant chemically or physically in a manner that would cause adverse water quality impacts to occur that would not occur if the pollutants were left instream.
  - (d) The discharge does not increase the identified intake pollutant concentration at the edge of the mixing zone, or at the point of discharge if a mixing zone is not allowed, as compared to the pollutant concentration in the intake water, unless the increased concentration does not cause or contribute to an excursion of an applicable water quality standard.
  - (e) The timing and location of the discharge would not cause adverse water quality impacts to occur that would not occur if the identified intake pollutant were left instream.
- (3) Upon a finding by the director under paragraph (C)(2) of this rule that a pollutant in the

discharge does not have reasonable potential, the director shall not be required to include a WQBEL for the identified intake pollutants in the discharger's NPDES permit, provided the following:

- (a) The NPDES permit fact sheet or statement of basis includes a specific determination that there is no reasonable potential for the discharge of an identified intake pollutant and the fact sheet or statement of basis references appropriate supporting documentation included in the administrative record.
  - (b) The NPDES permit requires all influent, effluent and ambient monitoring deemed necessary by the director to demonstrate that the conditions that led to the determination under paragraph (C)(2) of this rule are maintained during the term of the NPDES permit.
  - (c) The NPDES permit contains a reopener clause authorizing modification or revocation and reissuance of the NPDES permit if new information demonstrates changes in the conditions that led to the determination under paragraph (C)(2) of this rule.
- (4) Absent a finding by the director that an intake pollutant in the discharge does not have reasonable potential in accordance with paragraph (C)(2) of this rule, the director shall use the procedures set forth in paragraphs (A) and (B) of this rule to determine the reasonable potential of that pollutant.
- (5) Same body of water. An intake pollutant is considered to be from the same body of water as the discharge if the intake pollutant would have reached the vicinity of the outfall in the receiving water within a reasonable period of time had it not been removed by the discharger. This finding may be established if all of the following conditions apply:
- (a) The background concentration of the pollutant in the receiving water is similar to that in the intake water.
  - (b) There is a direct hydrological connection between the intake and discharge points.
  - (c) Water quality characteristics (e.g., temperature, pH, hardness) are similar in the intake and receiving waters.
- (6) The director may also consider other site-specific factors relevant to the transport and fate of the pollutant to make the finding in a particular case that a pollutant would or would not have reached the vicinity of the outfall in the receiving water within a reasonable period of time had it not been removed by the discharger.
- (7) The director may consider an intake pollutant from groundwater to be from the same body of water if the pollutant would have reached the vicinity of the outfall in the receiving water within a reasonable period of time had it not been removed by the discharger. Such a pollutant shall not be considered to be from the same body of water if the groundwater contains the pollutant partially or entirely due to human activity, such as industrial, commercial, or municipal operations, disposal actions, or treatment

processes.

(D) Other applicable conditions.

In the lake Erie drainage basin, if the geometric mean of a pollutant in fish tissue samples collected from a waterbody exceeds the tissue basis of a tier I criterion or tier II value, after consideration of the variability of the pollutant's bioconcentration and bioaccumulation in fish, each facility that discharges detectable levels of such pollutant to that water has the reasonable potential to cause or contribute to an excursion above a tier I criteria or a tier II value and the director shall establish a WQBEL for such pollutant in the NPDES permit for such facility.

Effective:	3/1/2018
Five Year Review (FYR) Dates:	11/15/2017 and 03/01/2023
Promulgated Under:	119.03
Statutory Authority:	6111.03, 6111.12
Rule Amplifies:	6111.12
Prior Effective Dates:	10/31/1997, 6/7/2011

**3745-2-07 Additive effects of pollutants.**

(A) Carcinogens.

(1) The incremental risk of each known or suspected carcinogen present in a discharge shall be considered additive in accordance with this rule. A known or suspected carcinogen is considered present if its preliminary effluent limitation (PEL) falls within group three, four or five of the reasonable potential procedures contained in rule 3745-2-06 of the Administrative Code.

(2) Except as provided in paragraphs (A)(3) and (A)(4) of this rule, the following equation shall be used to protect against additive effects associated with simultaneous human exposure to multiple chemicals:

$$MAC_1/HHWLA_1 + MAC_2/HHWLA_2 + \dots + MAC_n/HHWLA_n < \text{or} = 1$$

Where:

MAC = average concentration of all samples collected within the month for each limited or monitored carcinogen.

HHWLA = wasteload allocation (WLA) to meet human health criteria determined in accordance with rule 3745-2-05 of the Administrative Code.

(3) If the discharger demonstrates to the director's satisfaction that the carcinogenic risk is not additive for a pollutant, the director shall exclude that pollutant from paragraph (A)(2) of this rule.

(4) Adjustments to the equation in paragraph (A)(2) of this rule to account for the interaction among discharges to the same receiving water may be made on a case-by-case basis by the director.

(5) Carcinogens shall be considered to be conservative pollutants in the absence of other information.

(B) Noncarcinogens.

(1) Noncarcinogenic effects of individual pollutants shall not be considered to be additive unless available scientific information supports a reasonable assumption that the pollutants produce additive effects through the same mechanism of action.

(2) For noncarcinogens that have human health effects that have been shown by scientific evidence to be additive, the following equation shall be used to protect against additive effects associated with simultaneous human exposure to multiple chemicals:-:

$$PEL_1/HHWLA_1 + PEL_2/HHWLA_2 + \dots + PEL_n/HHWLA_n < \text{or} = 1$$



Where:

PEL = average PEL of each separate noncarcinogen.

HHWLA = WLA to meet human health criteria determined in accordance with rule 3745-2-05 of the Administrative Code.

(C) Other requirements.

- (1) For discharges containing one or more 2, 3, 7, 8-substituted chlorinated dibenzo-p-dioxins or 2, 3, 7, 8-substituted dibenzofurans, the 2, 3, 7, 8-TCDD toxicity equivalence concentration ( $TEC_{tcdd}$ ) shall be determined.
- (2) The values listed in table 1 of this rule shall be used to determine the  $TEC_{tcdd}$  using the following equation:
 
$$TEC_{tcdd} = \text{Sum} (C_x * TEF_x * BEF_x)$$
 Where:
 

$C_x$  = concentration of total chemical X in effluent.

$TEF_x$  = TCDD toxicity equivalency factor for X.

$BEF_x$  = TCDD bioaccumulation equivalency factor for X.
- (3) The  $TEC_{tcdd}$  concentration of a discharge shall be considered as one pollutant for purposes of the equation in paragraph (A)(2) of this rule (if carcinogenic) or paragraph (B)(2) of this rule (if noncarcinogenic).
- (4) The procedure in paragraph (C)(2) of this rule is also applicable when noncarcinogenic furans and dioxins are present in an effluent.

Table 1. TEFs and BEFs for chlorinated dibenzo dioxins and chlorinated dibenzo furans.

Congener	TEF	BEF
2,3,7,8-TCDD	1.0	1.0
1,2,3,7,8-PeCDD	0.5	0.9
1,2,3,4,7,8-HxCDD	0.1	0.3
1,2,3,6,7,8-HxCDD	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.05
OCDD	0.001	0.01
2,3,7,8-TCDF	0.1	0.8

1,2,3,7,8-PeCDF	0.05	0.2
2,3,4,7,8-PeCDF	0.5	1.6
1,2,3,4,7,8-HxCDF	0.1	0.08
1,2,3,6,7,8-HxCDF	0.1	0.2
2,3,4,6,7,8-HxCDF	0.1	0.7
1,2,3,7,8,9-HxCDF	0.1	0.6
1,2,3,4,6,7,8-HpCDF	0.01	0.01
1,2,3,4,7,8,9-HpCDF	0.01	0.4
OCDF	0.001	0.02

Effective: 3/1/2018  
 Five Year Review (FYR) Dates: 11/15/2017 and 03/01/2023

Promulgated Under: 119.03  
 Statutory Authority: 6111.03, 6111.12  
 Rule Amplifies: 6111.12  
 Prior Effective Dates: 10/31/1997, 12/30/2002, 6/7/2011

**Whole effluent toxicity provisions and water quality based effluent limit calculation procedures.**

- (A) For discharges of whole effluent toxicity (WET) to flowing receiving waters, the WQBEL for WET shall be calculated using the following mass balance equation:

$$\frac{WQC (Q_{\text{eff}} + Q_{\text{up}}) - Q_{\text{up}} (WQ_{\text{up}})}{Q_{\text{eff}}}$$

Where:

WQC = toxicity level as established in paragraph (A) of rule 3745-1-44 of the Administrative Code.

$Q_{\text{eff}}$  = effluent flow as established in paragraph (A)(4) of rule 3745-2-05 of the Administrative Code.

$Q_{\text{up}}$  = stream design flow as established in paragraphs (A)(1) and (A)(2) of rule 3745-2-05 of the Administrative Code.

$WQ_{\text{up}}$  = background water quality as established in paragraph (C) of this rule.

An alternative modeling method may be used if the discharger demonstrates to Ohio EPA's satisfaction that it is appropriate and protective of water quality criteria.

- (B) Background water quality for WET calculations shall be determined using the following requirements.

- (1) Use 0.0 chronic toxic units ( $TU_c$ ) for background chronic toxicity unless there is specific information indicating additivity between the discharge and another source or sources in the background waters. If there is evidence of additivity, use 0.5  $TU_c$  for background chronic toxicity. If sufficient data exists, use the average value of the data for background chronic toxicity.
- (2) To establish background levels of acute toxicity, Ohio EPA shall consider the likelihood for acute toxicity to exist in the background waters of the discharge using available information on the following factors:
  - (a) The degree and type of biological effects in the background waters determined with biological index measurements.
  - (b) The frequency and magnitude of acute toxicity occurrences in the background waters used in toxicity tests.
  - (c) Data on additive, synergistic, or antagonistic effects of a discharge when it

is combined with receiving water.

(d) The quality and quantity of each type of data available.

(e) Other relevant factors.

(3) After an analysis of the likelihood for acute toxicity to exist in the background waters of the discharge, background toxicity shall be set equal to one of the following values:

(a) If there is likelihood, use 0.15 acute toxic units ( $TU_a$ ) or if sufficient data are available and indicate that acute toxicity levels are routinely exceeded, use the average value of the data.

(b) If there is no likelihood or there are no data available to make an assessment of the likelihood, use 0.0  $TU_a$ .

(c) If background toxicity is due to an identifiable discharge that has not yet achieved toxicity limits required by paragraph (B) of rule 3745-33-07 of the Administrative Code, use 0.0  $TU_a$ .

(C) Wasteload allocation (WLA) results for acute toxicity shall not exceed 1.0  $TU_a$  unless the provisions in paragraph (B) of rule 3745-33-07 of the Administrative Code are met.

(D) Multiple discharges. When the director determines that it is necessary to consider multiple discharges in a WLA, the procedures defined in paragraph (A)(8) of rule 3745-2-05 of the Administrative Code shall be followed.

(E) WQBELs for WET for direct discharges to lakes or non-flowing receiving waters.

(1) WLAs to maintain chronic toxicity levels for direct discharges to non-flowing receiving waters shall be determined using the following equation:

$$11 (WQC) - 10 (BACK)$$

Where:

WQC = chronic toxicity level as established in paragraph (A) of rule 3745-1-44 of the Administrative Code.

BACK = background water quality as established in paragraph (C)(B) of this rule.

(2) WLAs for acute levels shall be set equal to 1.0  $TU_a$ .

- (3) A mixing demonstration may be conducted in accordance with rule 3745-1-06 of the Administrative Code to justify a different quantity of receiving water in the WLA determination for chronic levels. Allocation results for acute toxicity shall not exceed 1.0 TU<sub>a</sub> unless the provisions in paragraph (B) of rule 3745-33-07 of the Administrative Code are met.
- (4) An alternate modeling method may be used if the discharger demonstrates to Ohio EPA's satisfaction that it is appropriate and protective of water quality levels.

Effective:	02/06/2017
Five Year Review (FYR) Dates:	09/02/2016 and 02/06/2022
Promulgated Under:	119.03
Statutory Authority:	6111.03, 6111.12
Rule Amplifies:	6111.12
Prior Effective Dates:	10/31/1997, 12/30/2002, 6/7/2011

**3745-2-10 Wasteload allocation for ammonia-nitrogen toxicity.**

- (A) For discharges of ammonia-nitrogen (NH<sub>3</sub>-N) to flowing receiving waters, the wasteload allocation (WLA) shall be calculated using the following mass balance equation:

$$WLA = [WQC (Q_{eff} + Q_{up}) - Q_{up}(WQ_{up})] / Q_{eff}$$

Where:

WLA = wasteload allocation, as defined in rule 3745-2-02 of the Administrative Code.

WQC = water quality criterion as established in rule 3745-2-04 of the Administrative Code.

Q<sub>eff</sub> = effluent design flow as established in rule 3745-2-05 of the Administrative Code.

Q<sub>up</sub> = per cent of the upstream design flow as established in paragraph (B) of this rule.

WQ<sub>up</sub> = background water quality as established in rule 3745-2-05 of the Administrative Code.

Alternative modeling methods including, but not limited to, continuous simulation or probabilistic analyses, may be used if the director determines that they are appropriate and protective of water quality criteria.

- (B) The following stream design flows shall be used to determine WLAs to maintain water quality criteria for NH<sub>3</sub>-N toxicity.
- (1) May to November: 30Q10 for summer chronic aquatic life.
  - (2) December to February: 30Q10 for winter chronic aquatic life.
  - (3) May to November: 7Q10 for summer acute aquatic life.
  - (4) December to February: 7Q10 for winter acute aquatic life.
- (C) The WLAs shall use the per cent of stream design flow contained in paragraphs (A)(2)(a) to (A)(2)(c) of rule 3745-2-05 of the Administrative Code. The director may determine design flows for streams that are impacted by reservoirs or other physical alternations by taking into account relevant site-specific factors. Stream design flows for such impacted stream segments shall be established at levels that ensure protection of designated uses. Alternative flows or seasons may be used if the director determines that the flow or season is as protective as those listed in paragraph (B) of this rule.
- (D) WLAs to maintain the acute criteria shall be required for streams designated as limited resource water in Chapter 3745-1 of the Administrative Code, or for other streams for which the limited resource water criteria are applicable.
- (E) Exception for direct discharges to lake Erie. If it is necessary to determine a WLA for a direct discharge to lake Erie, the mixing assumptions contained in rule 3745-2-05 of the

Administrative Code shall be used.

- (F) Exception for direct discharges to the Ohio river. If it is necessary to determine a WLA for a direct discharge to the Ohio river, the mixing assumptions contained in rule 3745-2-05 of the Administrative Code shall be used.
- (G) Multiple discharges. When the director determines that it is necessary to consider multiple discharges in a WLA, the loading capacity may be distributed among discharges using a method deemed appropriate by the director based on site-specific considerations. This WLA shall be developed pursuant to rule 3745-2-05 of the Administrative Code.

Effective:	2/15/2019
Five Year Review (FYR) Dates:	11/14/2018 and 02/15/2024
Promulgated Under:	119.03
Statutory Authority:	6111.12, 6111.03
Rule Amplifies:	6111.12
Prior Effective Dates:	10/31/1997, 06/07/2011

**3745-2-11 Dissolved oxygen modeling.**

- (A) The loading capacity of a flowing receiving water for dissolved oxygen (D.O.) shall be determined by the use of mathematical water quality models. The models may range from simple solutions based on the Streeter-Phelps equation to complex, time variable models. The model complexity required shall be based on site-specific considerations. Whenever possible, these models should be calibrated and verified using site-specific data.
- (1) Alternative modeling methods including, but not limited to, continuous simulation or probabilistic analyses may be used if the director determines that they are appropriate and protective of water quality criteria.
  - (2) If the director does not have sufficient site-specific stream data for D.O., the director may conduct a wasteload allocation (WLA) to maintain the criteria for ammonia toxicity. The required effluent ammonia may then be used to make a decision regarding necessary treatment related to overall D.O. impact in the receiving water, based on available information on wastewater treatment processes.
- (B) The following stream design flows shall be used for dissolved oxygen modeling.
- (1) May to November: 7Q10 for summer.
  - (2) December to February: 7Q10 for winter.
  - (3) The director may determine design flows for streams that are impacted by reservoirs or other physical alterations by taking into account relevant site-specific factors. Stream design flows for such impacted stream segments shall be established to assure protection of designated uses.
  - (4) Alternative flows or seasons may be used if the director determines that the flow or season is as protective as those listed in paragraph (B) of this rule.
- (C) The background concentration of D.O. shall be based on the percentages of D.O. saturation in this paragraph at the temperature that represents the stream after mixing with the effluent. Site-specific D.O. values may be used if sufficient supporting data are available.
- (1) Ninety per cent of saturation shall be used for streams classified as exceptional warmwater or coldwater habitat.
  - (2) Eighty per cent of saturation shall be used for all other stream uses.
- (D) Exception for direct discharges to lake Erie. If it is necessary to determine a WLA for a direct discharge to lake Erie, the mixing assumptions contained in paragraph (B) of rule 3745-2-05 of the Administrative Code shall be used.
- (E) Exception for direct discharges to the Ohio river. If it is necessary to determine a WLA for a direct discharge to the Ohio river, the mixing assumptions contained in paragraph (A)(2)(f) of rule 3745-2-05 of the Administrative Code shall be used.



(F) Multiple discharges. When the director determines that it is necessary to consider multiple discharges in a WLA, the loading capacity may be distributed among discharges using a method deemed appropriate by the director, based on site-specific considerations. This WLA shall be developed pursuant to rule 3745-2-05 of the Administrative Code.

Effective:	3/1/2018
Five Year Review (FYR) Dates:	11/15/2017 and 03/01/2023
Promulgated Under:	119.03
Statutory Authority:	6111.03, 6111.12
Rule Amplifies:	6111.12
Prior Effective Dates:	10/31/1997

**3745-2-12 Total maximum daily loads.**

[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 3745-2-02 of the Administrative Code.]

(A) Administrative procedures.

(1) At a minimum, total maximum daily loads (TMDLs) shall be established in accordance with the listing and priority setting process established in Section 303(d) of the act and 40 C.F.R. 130.7.

(2) The director shall do the following for stakeholder involvement during TMDL development in accordance with section 6111.562 of the Revised Code:

(a) Provide notice of and opportunity for input during the development of a TMDL at each of the following stages:

(i) The project assessment study plan, including portions of the plan that seek to determine the causes and sources of impairments or threats.

(ii) The biological and water quality study report or an equivalent report.

(iii) The loading analysis plan, including, but not limited to, the proposed modeling approach and the water quality restoration targets, goals or criteria.

(iv) The preliminary modeling results including the following:

(a) Any management choices.

(b) Load allocations (LAs) for nonpoint sources of pollutants.

(c) Wasteload allocations (WLAs) for point sources of pollutants.

(d) Allowances for margin of safety and future growth.

(e) Permit limits necessary to achieve the WLAs.

(f) Preliminary TMDL implementation plan establishing specific actions, schedules and monitoring proposed to effectuate a TMDL.

(b) Provide notice as required in paragraph (A)(2)(a) of this rule to the following stakeholders:

(i) Potentially affected dischargers.

(ii) County soil and water conservation districts.

(iii) Other interested stakeholders. This may include a watershed specific stakeholder distribution list or listserv.

- (c) Allow not less than thirty days for input at each stage required in paragraph (A)(2)(a) of this rule.
- (d) For TMDLs in development prior to September 29, 2017, provide at least two opportunities for stakeholder input prior to submittal of the TMDL to U.S. EPA for approval.

[Comment: The director may provide stakeholder notification through posting of information on the Ohio EPA website and electronic notifications, or first class mail if electronic means are not available.]

[Comment: The director may convene a watershed advisory committee to provide input to Ohio EPA on an individual project throughout the TMDL development process.]

[Comment: The director may organize stakeholder meetings during the development of a TMDL depending upon the level of stakeholder interest in a given watershed.]

- (3) Official draft TMDL. The director shall prepare an official draft TMDL prior to establishing a final TMDL, as follows:
  - (a) The official draft TMDL shall include both of the following:
    - (i) An estimate of the total amount of each pollutant that causes water quality impairment from all sources.
    - (ii) An estimate of the total amount of pollutants that may be added to the water of the state while still allowing the water of the state to achieve and maintain applicable water quality standards.
  - (b) The director shall provide public notice of the official draft TMDL in accordance with rule 3745-49-07 of the Administrative Code. In addition to the information required by rule 3745-49-08 of the Administrative Code, the public notice shall specify both of the following:
    - (i) The water of the state to which the official draft TMDL relates.
    - (ii) The time, date and location of the public hearing, if applicable.
  - (c) The director shall send the public notice to the following stakeholders:
    - (i) All individuals NPDES permit holders that discharge into the water of the state to which the official draft TMDL relates.
    - (ii) All significant industrial users listed in the permit holders' annual report.
    - (iii) Other stakeholders that provided input during the development of the TMDL in accordance with paragraph (A)(2) of this rule.
    - (iv) Agency listservs or watershed specific stakeholder distribution list, if available.
  - (d) The director shall allow not less than sixty days for comment on the official draft

## TMDL.

- (e) The director shall provide an opportunity for public hearing regarding the official draft TMDL if there is significant public interest. Interested persons may request, in writing, that Ohio EPA hold a public hearing on an official draft TMDL within thirty days after the public notice of the official draft TMDL. Requests shall state the nature of issues proposed to be raised at the hearing. Ohio EPA will hold a public hearing if any of the following occur:
    - (i) Requests are made from one or more public officials, any affected state, U.S. EPA or other federal agency.
    - (ii) Requests are made from seven or more citizens.
    - (iii) Request is made from an organized citizens group, including watershed groups, trade associations or other non-profit organizations, or potentially impacted entities.
    - (iv) The director determines that the public interest would be served by holding a hearing.
  - (f) The director shall prepare and make available a written responsiveness summary of the comments received during the applicable comment period on the official draft TMDL. The director may consider comments received after the comment deadline as time and circumstances allow.
- (4) Final TMDL. After completion of the items in paragraph (A)(3) of this rule if the director determines it is appropriate to complete the TMDL, the director shall establish a final TMDL and submit the final TMDL to U.S. EPA for approval. A final TMDL may be challenged in accordance with section 6111.564 of the Revised Code.
- (5) TMDL modifications. The director may modify an official draft, final or U.S. EPA approved TMDL. A modification, other than a modification to a draft or final TMDL consistent with comments received, is subject to the requirements in paragraph (A)(3) of this rule.
- (6) Where a TMDL is not required by paragraph (A)(1) of this rule or it is not technically feasible to complete development of a TMDL prior to NPDES permit issuance or renewal deadlines for a discharge to a TMDL assessment area, Ohio EPA may develop water quality based effluent limits (WQBELs) for a discharge in the absence of a TMDL pursuant to rules 3745-2-04 to 3745-2-11 of the Administrative Code.
- (B) Development of TMDLs.
- (1) At a minimum, the following factors shall be considered when determining an assessment area for a TMDL:
    - (a) Area of impact.
    - (b) A linkage of the impaired use and the pollutant to be reduced.

- (c) Significance of the pollutant of concern.
  - (d) Location, type, significance and interaction of pollutant sources.
  - (e) The critical conditions and seasonality of the impacts from the pollutant.
  - (f) Availability of information.
  - (g) Treatability of pollutant and pollutant sources.
  - (h) Resources available to develop the TMDL implementation plan.
  - (i) Resources available for implementing the TMDL implementation plan.
  - (j) Coordination with other Ohio EPA programs and program requirements.
  - (k) Federal regulations and guidance regarding TMDLs.
- (2) A TMDL shall be determined as the sum of all existing or projected loads of a pollutant to the TMDL assessment area from point sources, nonpoint sources and background sources. The sum of the loads shall not be greater than the loading capacity of the receiving water for the pollutant minus a specified margin of safety (MOS) and any capacity reserved for future growth.
- (3) The background concentration of a pollutant for the purpose of establishing a TMDL shall be determined in accordance with rule 3745-2-05 of the Administrative Code. The director may apply alternative procedures to determine background concentrations if necessary to account for all conditions considered in the TMDL, including, but not limited to, cases where background concentrations vary substantially with flow such that a background concentration derived in accordance with rule 3745-2-05 of the Administrative code may not be appropriate.
- (4) The loading capacity for the purpose of establishing a TMDL shall be determined as the largest load of a pollutant that a water body can receive without violating water quality standards at any applicable site within the TMDL implementation plan assessment area (outside of applicable mixing zones). Separate loading capacities may be determined for each flow condition or season applicable to the TMDL. Pollutant loads for sources which only affect the receiving water at certain flow conditions shall be determined to maintain only the loading capacities applicable at those conditions.
- (5) Each TMDL shall include a MOS sufficient to account for technical uncertainties in establishing the TMDL. The TMDL implementation plan shall describe the manner in which the MOS is determined and incorporated into the TMDL. The MOS may be provided by leaving a portion of the loading capacity unallocated or by using conservation modeling assumptions to establish WLAs and LAs.
- (6) TMDLs may include reserved allocations of loading capacity to accommodate various needs including, but not limited to, future growth, additional sources and environmental reserves. Where adequate reserved allocations are not included in a TMDL, any increased loadings of the pollutant for which the TMDL was developed that are due to a

new or expanded discharge shall not be allowed unless the TMDL is revised in accordance with this rule and section 6111.563 of the Revised Code to include an allocation for the new or expanded discharge.

- (7) Where appropriate and where sufficient data are available, TMDLs shall reflect contributions to the water column from sediments inside and outside of any applicable mixing zones. TMDLs shall be sufficiently stringent so as to prevent accumulation of the pollutant of concern in sediments to levels injurious to designated or existing uses, human health, wildlife and aquatic life criteria.
- (8) TMDLs shall be based on the assumption that a pollutant does not degrade. However, the director may take into account degradation of the pollutant if each of the following conditions are met:
  - (a) Scientifically valid field studies or other relevant information demonstrate that degradation of the pollutant is expected to occur under the full range of environmental conditions expected to be encountered.
  - (b) Scientifically valid field studies or other relevant information address other factors that affect the level of pollutants in the water column including, but not limited to, resuspension of sediments, chemical speciation and biological and chemical transformation.
- (9) TMDLs for metals shall be determined based on the total recoverable form of that metal provided by all sources considered in that TMDL. The loading capacity for that TMDL shall be determined to maintain the total recoverable criteria applicable to that metal, with the following exceptions:
  - (a) A WLA may be based on dissolved criteria in accordance with rule 3745-2-04 of the Administrative Code, provided that the WLA does not result in a total recoverable load in excess of that allocated to the point source as part of an established TMDL.
  - (b) The loading capacity may be based on an effective total recoverable criteria, determined from applicable dissolved criteria in accordance with rule 3745-2-04 of the Administrative Code, provided that the dissolved metal translator applied in determination of the effective total recoverable criteria can be demonstrated to be appropriate and protective for all sources of that metal and all receiving water conditions considered in the TMDL.
- (10) TMDLs shall reflect, where appropriate and where sufficient data are available, point source and nonpoint source pollutant loads resulting from wet weather events.
- (11) In addition to the requirements of paragraphs (B)(1) to (B)(10) of this rule, the director shall consider and evaluate the factors in divisions (B) and (C) of section 6111.562 of the Revised Code.

(C) Nonpoint source load allocations (LAs).

- (1) For the purpose of establishing a TMDL, LAs shall be based on at least the following information:

- (a) Existing pollutant loadings if changes in loadings are not reasonably anticipated to occur.
  - (b) Increases in pollutant loadings that are reasonably anticipated to occur.
  - (c) Anticipated decreases in pollutant loadings if such decreased loadings are technically feasible and are reasonably anticipated to occur within a reasonable time period as a result of implementation of best management practices or other load reduction measures.
- (2) For LAs established on the basis of paragraph (C)(1)(c) of this rule, monitoring data shall be collected and analyzed in order to validate the TMDL's assumptions, to verify anticipated load reductions, to evaluate the effectiveness of controls being used to implement the TMDL implementation plan and to revise the point source allocations and LAs as necessary to ensure that water quality standards will be achieved within the time-period established in the TMDL.
- (3) For nonpoint sources considered in a TMDL that may affect the receiving water at stream flows at or below the stream design flows applicable under rule 3745-2-05 of the Administrative Code, LAs established in a TMDL shall be determined in accordance with rule 3745-2-05 of the Administrative Code such that water quality criteria are maintained at the design conditions.
- (4) For nonpoint sources considered in a TMDL that only affect the receiving water at stream flows higher than the stream design flows applicable under rule 3745-2-05 of the Administrative Code, LAs may be established using stream flows and procedures that the director determines are appropriate for that nonpoint source and ensure that applicable water quality standards will be maintained whenever that nonpoint source load occurs.
- (D) Point source wasteload allocations (WLAs). Pollutant loads allocated to point sources in a TMDL shall be used to determine WLAs for those point sources.
- (1) If TMDLs are established in TMDL implementation plans for different segments of the same watershed and include allocations for the same pollutant for the same point source, then WLAs for that pollutant and point source shall be consistent with the most stringent of those allocations.
  - (2) For point sources considered in a TMDL that discharge at stream flows at or below the stream design flows applicable under rule 3745-2-05 of the Administrative Code, WLAs shall be determined in accordance with rule 3745-2-05 of the Administrative Code such that water quality criteria are maintained at the design conditions.
  - (3) For point sources considered in a TMDL that only discharge at stream flows higher than the stream design flows applicable under rule 3745-2-05 of the Administrative Code, WLAs may be established using stream flows and procedures that the director determines are appropriate for that point source and ensure that applicable water quality standards will be maintained whenever that point source load occurs.
  - (4) WLAs determined as part of a TMDL shall be used to determine WQBELs for that

discharge in accordance with rule 3745-2-06 of the Administrative Code.

(E) TMDL Implementation.

- (1) TMDLs shall be established and implemented through a TMDL implementation plan. An implementation plan shall address attainment of applicable water quality standards, determined in accordance with rule 3745-2-04 of the Administrative Code (or as otherwise applicable in accordance with Chapter 3745-1 of the Administrative Code) for each pollutant for which a TMDL is established.
  - (2) Where an assessment and remediation plan meets the requirements of this rule and the public participation requirements applicable to TMDLs, Ohio EPA may use the assessment and remediation plan in lieu of a TMDL implementation plan. Assessment and remediation plans may include, but are not limited to, the lake Erie lakewide management plan, remedial action plans and water quality management plans. Any part of an assessment and remediation plan that satisfies one or more requirements under Section 303(d) of the act or the act's implementing regulations may be part of a TMDL implementation plan.
  - (3) A TMDL implementation plan may be based on attaining water quality standards over a period of time, with specific controls on individual sources being implemented in stages. Where implementing a TMDL implementation plan will not immediately attain water quality standards, the TMDL implementation plan shall reflect reasonable assurances that water quality standards will be attained in a reasonable period of time. At a minimum, the following factors shall be considered by Ohio EPA in determining the reasonable period of time in which water quality standards will be met:
    - (a) Receiving water characteristics.
    - (b) Persistence, behavior and ubiquity of pollutants of concern.
    - (c) Type of remediation activities necessary.
    - (d) Available regulatory and non-regulatory controls.
    - (e) Other requirements for attainment of water quality standards.
- (F) All public records created in the development of the TMDL shall be made available upon request in accordance with section 149.43 of the Revised Code.



Replaces: 3745-2-12  
Effective: 2/15/2019  
Five Year Review (FYR) Dates: 02/15/2024

Promulgated Under: 119.03  
Statutory Authority: 6111.563, 6111.12, 6111.03  
Rule Amplifies: 6111.12, 6111.563  
Prior Effective Dates: 10/31/1997, 10/05/2007, 06/07/2011