

3745-266-112

Regulation of residues.

A residue derived from the burning or processing of hazardous waste in a boiler or industrial furnace is not excluded from the definition of a hazardous waste under paragraph (B)(4), (B)(7), or (B)(8) of rule 3745-51-04 of the Administrative Code unless the device and the owner or operator meet the following requirements:

(A) The device meets the following criteria:

- (1) Boilers. Boilers must burn at least fifty per cent coal on a total heat input or mass input basis, whichever results in the greater mass feed rate of coal;
- (2) Ore or mineral furnaces. Industrial furnaces subject to paragraph (B)(7) of rule 3745-51-04 of the Administrative Code must process at least fifty per cent by weight normal, nonhazardous raw materials;
- (3) Cement kilns. Cement kilns must process at least fifty per cent by weight normal cement-production raw materials;

(B) The owner or operator demonstrates that the hazardous waste does not significantly affect the residue by demonstrating conformance with either of the following criteria:

- (1) Comparison of waste-derived residue with normal residue. The waste-derived residue must not contain constituents in the appendix to rule 3745-51-11 of the Administrative Code (toxic constituents) that could reasonably be attributable to the hazardous waste at concentrations significantly higher than in residue generated without burning or processing of hazardous waste, using the following procedure. Toxic compounds that could reasonably be attributable to burning or processing the hazardous waste (constituents of concern) include toxic constituents in the hazardous waste, and the organic compounds listed in appendix II to this rule that may be generated as products of incomplete combustion. ~~Sampling and analyses must be in conformance with procedures prescribed in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods."~~ For polychlorinated dibenzo-p-dioxins and polychlorinated dibenzo-furans, analyses must be performed to determine specific congeners and homologues, and the results converted to 2,3,7,8-TCDD equivalent values using the procedure specified in section 4.0 of the appendix to rule 3745-266-103 of the Administrative Code.
 - (a) Normal residue. Concentrations of toxic constituents of concern in normal residue must be determined based on analyses of a minimum of ten samples representing a minimum of ten days of operation. Composite samples may be used to develop a sample for analysis provided that the

compositing period does not exceed twenty-four hours. The upper tolerance limit (at ninety-five per cent confidence with a ninety-five per cent proportion of the sample distribution) of the concentration in the normal residue must be considered the statistically-derived concentration in the normal residue. If changes in raw materials or fuels reduce the statistically-derived concentrations of the toxic constituents of concern in the normal residue, the statistically-derived concentrations must be revised or statistically-derived concentrations of toxic constituents in normal residue must be established for a new mode of operation with the new raw material or fuel. To determine the upper tolerance limit in the normal residue, the owner or operator must use statistical procedures prescribed in "Statistical Methodology for Beville Residue Determinations" in the appendix to rule 3745-266-103 of the Administrative Code.

- (b) Waste-derived residue. Waste-derived residue must be sampled and analyzed as often as necessary to determine whether the residue generated during each twenty-four-hour period has concentrations of toxic constituents that are higher than the concentrations established for the normal residue under paragraph (B)(1)(a) of this rule. If so, hazardous waste burning has significantly affected the residue and the residue must not be excluded from the definition of a hazardous waste. Concentrations of toxic constituents of concern in the waste-derived residue must be determined based on analysis of one or more samples obtained over a twenty-four-hour period. Multiple samples may be analyzed, and multiple samples may be taken to form a composite sample for analysis provided that the sampling period does not exceed twenty-four hours. If more than one sample is analyzed to characterize waste-derived residues generated over a twenty-four-hour period, the concentration of each toxic constituent must be the arithmetic mean of the concentrations in the samples. No results may be disregarded; or

(2) Comparison of waste-derived residue concentrations with health-based limits.

- (a) Nonmetal constituents. The concentration of each nonmetal toxic constituent of concern [specified in paragraph (B)(1) of this rule] in the waste-derived residue must not exceed the health-based level specified in appendix I to this rule, or the level of detection (using analytical procedures prescribed in SW-846), whichever is higher. If a health-based limit for a constituent of concern is not listed in appendix I to this rule, then a limit of 0.002 micrograms per kilogram or the level of detection (~~which must be determined by using appropriate analytical procedures contained in SW-846, or other appropriate methods~~), whichever is higher, must be used.

[Note: The levels specified in appendix I to this rule (and the default level of 0.002 micrograms per kilogram or the level of detection for constituents as identified in note 1 of appendix I of this rule) have been administratively stayed by U.S. EPA under the condition, for the constituents specified in paragraph (B)(1) of this rule, that the owner or operator complies with alternate levels defined as the land disposal restriction limits specified in rule 3745-270-40 of the Administrative Code for F039 nonwastewaters. Ohio EPA will interpret this rule consistent with U.S. EPA's administrative stay.]

- (b) Metal constituents. The concentration of metals in an extract obtained using the toxicity characteristic leaching procedure of rule 3745-51-24 of the Administrative Code must not exceed the levels specified in appendix I to this rule; and
 - (c) Sampling and analysis. Waste-derived residue must be sampled and analyzed as often as necessary to determine whether the residue generated during each twenty-four-hour period has concentrations of toxic constituents that are higher than the health-based levels. Concentrations of toxic constituents of concern in the waste-derived residue must be determined based on analysis of one or more samples obtained over a twenty-four-hour period. Multiple samples may be analyzed, and multiple samples may be taken to form a composite sample for analysis provided that the sampling period does not exceed twenty-four hours. If more than one sample is analyzed to characterize waste-derived residues generated over a twenty-four-hour period, the concentration of each toxic constituent must be the arithmetic mean of the concentrations in the samples. No results may be disregarded; and
- (C) Records sufficient to document compliance with the provisions of this rule must be retained until closure of the boiler or industrial furnace unit. At a minimum, the following must be recorded.
- (1) Levels of constituents in the appendix to rule 3745-51-11 of the Administrative Code that are present in waste-derived residues;
 - (2) If the waste-derived residue is compared with normal residue under paragraph (B)(1) of this rule:
 - (a) The levels of constituents in the appendix to rule 3745-51-11 of the Administrative Code that are present in normal residues; and

- (b) Data and information, including analyses of samples as necessary, obtained to determine if changes in raw materials or fuels would reduce the concentration of toxic constituents of concern in the normal residue.

[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 3745-50-11 of the Administrative Code titled "Incorporated by reference."]

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Date

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EXISTING APPENDIX

1

Appendix I to rule 3745-266-112 of the Administrative Code
Health-Based Limits for Exclusion of Waste-Derived Residues *

Metals- TCLP Extract Concentration Limits		
Constituent	CAS Number	Concentration limits (mg/L)
Antimony	7440-36-0	1xE+00
Arsenic	7440-38-2	5xE+00
Barium	7440-39-3	1xE+02
Beryllium	7440-41-7	7xE-03
Cadmium	7440-43-9	1xE+00
Chromium	7440-47-3	5xE+00
Lead	7439-92-1	5xE+00
Mercury	7439-97-6	2xE-01
Nickel	7440-02-0	7xE+01
Selenium	7782-49-2	1xE+00
Silver	7440-22-4	5xE+00
Thallium	7440-28-0	7xE+00

Nonmetals- Residue Concentration Limits		
Constituent	CAS Number	Concentration limits for residues (mg/kg)
Acetonitrile	75-05-8	2xE-01
Acetophenone	98-86-2	4xE+00
Acrolein	107-02-8	5xE-01
Acrylamide	79-06-1	2xE-04
Acrylonitrile	107-13-1	7xE-04
Aldrin	309-00-2	2xE-05
Allyl alcohol	107-18-6	2xE-01
Aluminum phosphide	20859-73-8	1xE-02
Aniline	62-53-3	6xE-02
Barium cyanide	542-62-1	1xE+00
Benz(a)anthracene	56-55-3	1xE-04
Benzene	71-43-2	5xE-03
Benzidine	92-87-5	1xE-06

Nonmetals- Residue Concentration Limits		
Constituent	CAS Number	Concentration limits for residues (mg/kg)
Bis(2-chloroethyl) ether	111-44-4	3xE-04
Bis(chloromethyl) ether	542-88-1	2xE-06
Bis(2-ethylhexyl) phthalate	117-81-7	3xE+01
Bromoform	75-25-2	7xE-01
Calcium cyanide	592-01-8	1xE-06
Carbon disulfide	75-15-0	4xE+00
Carbon tetrachloride	56-23-5	5xE-03
Chlordane	57-74-9	3xE-04
Chlorobenzene	108-90-7	1xE+00
Chloroform	67-66-3	6xE-02
Copper cyanide	544-92-3	2xE-01
Cresols (Cresylic acid)	1319-77-3	2xE+00
Cyanogen	460-19-5	1xE+00
DDT	50-29-3	1xE-03
Dibenz(a, h)-anthracene	53-70-3	7xE-06
1,2-Dibromo-3-chloropropane	96-12-8	2xE-05
p-Dichlorobenzene	106-46-7	7.5xE-02
Dichlorodifluoromethane	75-71-8	7xE+00
1,1-Dichloroethylene	75-35-4	5xE-03
2,4-Dichlorophenol	120-83-2	1xE-01
1,3-Dichloropropene	542-75-6	1xE-03
Dieldrin	60-57-1	2xE-05
Diethyl phthalate	84-66-2	3xE+01
Diethylstilbesterol	56-53-1	7xE-07
Dimethoate	60-51-5	3xE-02
2,4-Dinitrotoluene	121-14-2	5xE-04
Diphenylamine	122-39-4	9xE-01
1,2-Diphenylhydrazine	122-66-7	5xE-04
Endosulfan	115-29-7	2xE-03
Endrin	72-20-8	2xE-04
Epichlorohydrin	106-89-8	4xE-02
Ethylene dibromide	106-93-4	4xE-07
Ethylene oxide	75-21-8	3xE-04
Fluorine	7782-41-4	4xE+00
Formic acid	64-18-6	7xE+01

Nonmetals- Residue Concentration Limits		
Constituent	CAS Number	Concentration limits for residues (mg/kg)
Heptachlor	76-44-8	8xE-05
Heptachlor epoxide	1024-57-3	4xE-05
Hexachlorobenzene	118-74-1	2xE-04
Hexachlorobutadiene	87-68-3	5xE-03
Hexachlorocyclopentadiene	77-47-4	2xE-01
Hexachlorodibenzo-p-dioxins	19408-74-3	6xE-08
Hexachloroethane	67-72-1	3xE-02
Hydrazine	302-01-1	1xE-04
Hydrogen cyanide	74-90-8	7xE-05
Hydrogen sulfide	7783-06-4	1xE-06
Isobutyl alcohol	78-83-1	1xE+01
Methomyl	16752-77-5	1xE+00
Methoxychlor	72-43-5	1xE-01
3-Methylcholanthrene	56-49-5	4xE-05
4,4'-Methylenebis (2-chloroaniline)	101-14-4	2xE-03
Methylene chloride	75-09-2	5xE-02
Methyl ethyl ketone (MEK)	78-93-3	2xE+00
Methyl hydrazine	60-34-4	3xE-04
Methyl parathion	298-00-0	2xE-02
Naphthalene	91-20-3	1xE+01
Nickel cyanide	557-19-7	7xE-01
Nitric oxide	10102-43-9	4xE+00
Nitrobenzene	98-95-3	2xE-02
N-Nitrosodi-n-butylamine	924-16-3	6xE-05
N-Nitrosodiethylamine	55-18-5	2xE-06
N-Nitroso-N-methylurea	684-93-5	1xE-07
N-Nitrosopyrrolidine	930-55-2	2xE-04
Pentachlorobenzene	608-93-5	3xE-02
Pentachloronitrobenzene (PCNB)	82-68-8	1xE-01
Pentachlorophenol	87-86-5	1xE+00
Phenol	108-95-2	1xE+00
Phenylmercury acetate	62-38-4	3xE-03
Phosphine	7803-51-2	1xE-02
Polychlorinated biphenyls, N.O.S	1336-36-3	5xE-05
Potassium cyanide	151-50-8	2xE+00

Nonmetals- Residue Concentration Limits		
Constituent	CAS Number	Concentration limits for residues (mg/kg)
Potassium silver cyanide	506-61-6	7xE+00
Pronamide	23950-58-5	3xE+00
Pyridine	110-86-1	4xE-02
Reserpine	50-55-5	3xE-05
Selenourea	630-10-4	2xE-01
Silver cyanide	506-64-9	4xE+00
Sodium cyanide	143-33-9	1xE+00
Strychnine	57-24-9	1xE-02
1,2,4,5-Tetrachlorobenzene	95-94-3	1xE-02
1,1,2,2-Tetrachloroethane	79-34-5	2xE-03
Tetrachloroethylene	127-18-4	7xE-01
2,3,4,6-Tetrachlorophenol	58-90-2	1xE-02
Tetraethyl lead	78-00-2	4xE-06
Thiourea	62-56-6	2xE-04
Toluene	108-88-3	1xE+01
Toxaphene	8001-35-2	5xE-03
1,1,2-Trichloroethane	79-00-5	6xE-03
Trichloroethylene	79-01-6	5xE-03
Trichloromonofluoromethane	75-69-4	1xE+01
2,4,5-Trichlorophenol	95-95-4	4xE+00
2,4,6-Trichlorophenol	88-06-2	4xE+00
Vanadium pentoxide	1314-62-1	7xE-01
Vinyl chloride	75-01-4	2xE-03
Note 1:	The health-based concentration limits for constituents found in the appendix to rule 3745-51-11 of the Administrative Code for which a health-based concentration is not provided here is 2xE-06 mg/kg.	
Note 2:	The levels specified in this appendix and the default level of 0.002 mg/kg or the level of detection for constituents as identified in Note 1 of this appendix are administratively stayed by U.S. EPA under the condition, for those constituents specified in paragraph (B)(1) of rule 3745-266-112 of the Administrative Code, that the owner or operator complies with alternative levels defined as the land disposal restriction limits specified in rule 3745-270-40 of the Administrative Code for F039 nonwastewaters. See paragraph (B)(2)(a)[Note] of this rule.	

[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 3745-50-11 of the Administrative Code titled "Incorporated by reference."]

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EXISTING APPENDIX

1

Appendix II to rule 3745-266-112 of the Administrative Code
Potential PICs for Determination of Exclusion of Waste-Derived Residues

PICs Found in Stack Effluents	
Volatiles	Semivolatiles
Benzene Toluene Carbon tetrachloride Chloroform Methylene chloride Trichloroethylene Tetrachloroethylene 1,1,1-Trichloroethane Chlorobenzene cis-1,4-Dichloro-2-butene Bromochloromethane Bromodichloromethane Bromoform Bromomethane Methylene bromide Methyl ethyl ketone	Bis(2-ethylhexyl)phthalate Naphthalene Phenol Diethyl phthalate Butyl benzyl phthalate 2,4-Dimethylphenol o-Dichlorobenzene m-Dichlorobenzene p-Dichlorobenzene Hexachlorobenzene 2,4,6-Trichlorophenol Fluoranthene o-Nitrophenol 1,2,4-Trichlorobenzene o-Chlorophenol Pentachlorophenol Pyrene Dimethyl phthalate Mononitrobenzene 2,6-Toluene diisocyanate Polychlorinated dibenzo-p-dioxins * Polychlorinated dibenzo-furans *
* Analyses for polychlorinated dibenzo-p-dioxins and polychlorinated dibenzo-furans are required only for residues collected from areas downstream of the combustion chamber (e.g., ductwork, boiler tubes, heat exchange surfaces, air pollution control devices, etc.).	

[Comment: Analysis is not required for those compounds that do not have an established F039 nonwastewater concentration limit.]

[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 3745-50-11 of the Administrative Code titled "Incorporated by reference."]