

3745-300-08 Generic Numerical Standards.

(A) Definitions. As used in this rule:

(1) “Generic direct-contact soil standard” means a generic numerical standard based on an exposure resulting from ingestion of soil, dermal contact with soil or inhalation of volatile and particulate emissions from soil.

(2) “Generic numerical standard” means a concentration of a hazardous substance or petroleum that exists on a property that ensures protection of public health and safety and the environment for the reasonable exposures associated with a residential, commercial or industrial land use or potable ground water use. For purposes of this chapter, generic numerical standards include standards for direct-contact soils, ground water and surface water.

(B) Generic direct-contact soil standards.

(1) Applicability.

(a) The generic direct-contact soil standards at paragraph (B)(3) of this rule may apply to a property unless any of the circumstances identified in paragraphs (B)(1)(b) and (B)(1)(c) of this rule apply.

(b) A property-specific risk assessment must be conducted following the procedures established in the risk assessment rule to determine applicable standards in place of or in addition to using the generic direct-contact soil standards if any of the following circumstances apply to the property:

(i) The exposure pathways for the intended land use, as identified in accordance with paragraph (D)(2) of rule 3745-300-07 of the Administrative Code, the “Phase II rule”, include pathways that are not listed in the “SUPPORT Document for Generic Standards” for that intended land use;

(ii) The exposure factors for the intended land use include exposure factor values not listed in the “Support Document for Generic Standards” or receptor populations that are not listed in paragraph (B)(2)(c) of this rule;

(iii) The chemical(s) of concern are not included in paragraph (B)(3) of this rule. if only some of the chemical(s) of concern identified have a generic direct-contact soil standard value listed in paragraph (B)(3) of this rule, a volunteer may use the applicable generic direct-contact soil standards, and, for the chemical(s) of concern which do not have generic direct-contact soil standards, determine an applicable standard following the risk assessment procedures contained in the risk assessment rule. when using a combination of generic direct-contact soil standards and applicable standards, determined by a

risk assessment, the volunteer must adjust the concentrations of the applicable standards, using the procedures contained in paragraph (B)(2)(b) of this rule to meet the human health risk based levels described in paragraphs (B)(2)(a) of this rule;

(iv) Engineering controls or institutional controls are used to meet applicable standards, other than the industrial and commercial land use restrictions contained in paragraph (B)(2)(c) of this rule;

(v) It is determined, as a result of a "Phase II Property Assessment" conducted in accordance with the "Phase II rule", that important ecological resources or sediments are impacted by hazardous substances or petroleum.

(vi) It is determined, as a result of a "Phase II Property Assessment" that includes the assessments required by paragraph (D)(3) of rule 3745-300-07 of the Administrative Code, the "Phase II rule", that hazardous substances or petroleum are leaching or will leach to ground water and leaching of hazardous substances or petroleum to ground water underlying or emanating from the property is required to be controlled in accordance with paragraph (E) of rule 3745-300-10 of the Administrative Code, the groundwater classification rule; or

(c) If it is determined, as a result of a Phase II property assessment that includes the assessments required by paragraph (D)(1) of rule 3745-300-07 of the Administrative Code, the "Phase II rule", that radioactive materials are identified at a property, the volunteer must comply with the "Atomic Energy act of 1954," 68 Stat. 919, 42 U.S.C.A. 2011, as amended, and regulations adopted thereunder and Chapter 3701. or 3747. of the Revised Code and rules adopted thereunder.

(d) If the generic direct-contact soil standards, listed in paragraph (B)(3) of this rule are applied to one or more identified areas of the property and applicable standards are applied to one or more other areas of the property, as determined following rule 3745-300-09 of the Administrative Code, the risk assessment rule, then the volunteer must ensure that the risks for the property do not exceed:

(i) One excess cancer in a population of 100,000 (1×10^{-5}); and

(ii) A hazard index of 1.

(2) Assumptions.

(a) Single chemical.

The generic direct-contact soil standards presented in paragraph (B)(3) of this rule assume a single chemical of concern is present on a property.

(i) The generic direct-contact soil standards set forth in paragraph (B)(3) of this rule are based on the following:

(A) For hazardous substances having carcinogenic effects, the chemical-specific carcinogenic risk must not exceed one excess cancer in a population of 100,000 (I.E. 1×10^{-5}); and

(B) For hazardous substances having non-carcinogenic effects, the chemical-specific risk must not exceed a hazard index of 1.

(ii) The ninety-five per cent upper confidence limit or maximum concentration, as determined in accordance with paragraph (D)(5) of rule 3745-300-07 of the Administrative Code, the “Phase II rule”, must not exceed the single chemical generic direct-contact soil standard.

(b) Multiple chemicals.

When more than one chemical of concern is present on a property and an applicable generic direct-contact soil standard for each of the chemical(s) of concern is contained in subparagraph (B)(3)(a)(ii), (B)(3)(c), (B)(3)(d) or (B)(3)(e) of this rule, the concentrations must be adjusted to meet the human health risk based levels described in paragraph (B)(2)(a) of this rule, using the procedure and equations in this paragraph. The same cumulative adjustment described above must be made when using a combination of generic direct-contact standards and applicable standards, as determined by a risk assessment. The cumulative adjustment must be made as follows:

(i) For cancer risk estimates: determine the cancer risk ratio for each chemical of concern by dividing the maximum or ninety-five per cent upper confidence limit concentration of each carcinogenic chemical of concern on the property ($[CHEM_x]$), as determined in accordance with paragraph (D)(5) of rule 3745-300-07 of the Administrative Code, the “Phase II rule”, by the appropriate chemical concentration that is listed in the “Single Chemical Carcinogen” column contained in paragraph (B)(3) of this rule or the applicable single chemical standard determined in accordance with rule 3745-300-09 of the Administrative Code. The cancer risk ratios for all of the carcinogenic chemical(s) of concern identified at the Property must be added to calculate a cumulative risk ratio by the following

equation:

$$\left(\frac{MCS_a}{GCS_a} + \frac{MCS_b}{GCS_b} + \dots \right) \leq 1$$

Where “GCS” means generic direct-contact soil standard that is listed in the “Single Chemical Carcinogen” column in paragraph (B)(3) of this rule and [CHEM_x] means chemical-specific exposure point concentration for the direct- contact soils.

If the cumulative cancer risk ratio exceeds one, then a multiple chemical generic direct-contact soil standard must be derived for each carcinogenic chemical. the multiple chemical generic standard for each carcinogenic chemical of concern identified at a property must be calculated so that the sum of the risk ratios of the multiple chemical generic standard to the single chemical generic standard does not exceed one, as described in the following equation:

Where “GCS” means generic direct-contact soil standard that is listed in the “Single Chemical Carcinogen” column in paragraph (B)(3) of this rule, and “MCS” means generic direct-contact soil standard adjusted for the presence of multiple carcinogenic chemicals of concern. The applicable standard for each carcinogen will be the lowest of the values representing the appropriately adjusted single chemical carcinogen concentration or, if appropriate, the soil saturation concentration.

(ii) For non-carcinogenic hazard index estimates: determine the non-cancer risk ratio for each chemical of concern by dividing the maximum or ninety-five per cent upper confidence limit concentration of each non-carcinogenic chemical of concern on the property ([CHEM_x]), as determined in accordance with paragraph (D)(5) of rule 3745-300-07 of the Administrative Code, the “Phase II Rule”, by the appropriate chemical concentration that is listed in the “Single Chemical Non-carcinogen” column contained in paragraph (B)(3) of this rule or the applicable single chemical standard determined in accordance with rule 3745-300-09 of the Administrative Code. The non-cancer risk ratios for all the non-carcinogenic chemical(s) of concern identified at a property must be added to determine a cumulative non-cancer risk ratio by the following equation:

$$\left(\frac{[chem_a]}{GNCS_a} + \frac{[chem_b]}{GNCS_b} + \dots \right) = \text{cumulative noncancer risk ratio for direct contact soils on the Property}$$

Where “GNCS” means the generic direct soil contact standard that is listed in the “Single Chemical Non-carcinogen” COLUMN IN PARAGRAPH (B)(3) of

this rule, and [CHEM_x] means chemical-specific exposure point concentration for direct-contact soils. Non-cancer risk ratios for non-carcinogenic chemical(s) of concern which do not exhibit the same toxic endpoint may be excluded from the calculation of the cumulative non-cancer risk ratio described above if a written justification for such an exclusion is submitted. The consideration of all major toxic endpoints and mechanisms of action must include, at a minimum, those identified with the critical effect upon which the “Reference Dose” or “Reference Concentration” for each non-carcinogenic chemical of concern is based. The source for each “Reference Dose” and “Reference Concentration” for each non-carcinogenic chemical for which generic direct contact soil standards have been derived, are cited in the “Support Document for Generic Standards.”

[Comment: it may be necessary to calculate more than one cumulative non-cancer risk ratio for a property resulting from the segregation of non-carcinogenic chemicals of concern on the basis of toxic endpoints or mechanisms of action.]

If any of the one or more cumulative non-cancer risk ratios calculated exceeds one, then a multiple chemical direct-contact soil standard must be derived for each non-carcinogenic chemical of concern included in the calculation of that cumulative non-cancer risk ratio. the multiple chemical generic standard for each non-carcinogenic chemical of concern identified at a property must be calculated so that the sum of the non-cancer risk ratios of the multiple chemical generic standard to the single chemical generic standard does not exceed one, as described in the following equation:

$$\left(\frac{MNCS_a}{GNCS_a} + \frac{MNCS_b}{GNCS_b} + \dots \right) \leq 1.0 \text{ (a hazard index of 1.0)}$$

Where “GNCS” means the generic direct-contact soil standard that is listed in the “Single Chemical Non-carcinogen” column in paragraph (B)(3) of this rule, and “MNCS” means generic direct-contact soil standard adjusted for the presence of multiple non-carcinogenic chemicals of concern. The applicable standard for each non-carcinogen will be the lowest of the values representing the appropriately adjusted single chemical non-carcinogen concentration or, if appropriate, the soil saturation concentration.

(iii)FOR SITUATIONS WHERE A CHEMICAL OF CONCERN POSES BOTH
CARCINOGENIC AND NONCARCINOGENIC RISK AND A
CHEMICAL CONCENTRATION IS LISTED IN BOTH THE

“Single Chemical Carcinogen” column and the “Single Chemical Non-carcinogen” column contained in paragraph (B)(3) of this rule or an applicable single chemical carcinogen and non-carcinogen standard has been determined in accordance with rule 3745-300-09 of the Administrative Code, the chemical of concern must be evaluated in the multiple carcinogenic chemical adjustment calculation under paragraph (B)(2)(b)(i) of this rule and the multiple non-carcinogenic chemical adjustment calculation under paragraph (B)(2)(b)(ii) of this rule. The applicable standard for the chemical of concern will be the lowest concentration determined by using the equations in this paragraph, or the soil saturation concentration if appropriate.

(c) Land use categories.

The generic direct-contact soil standards established in this rule are based upon the intended use of the property after the completion of a voluntary action. Land use must be determined according to the categories listed below:

[Comment: a volunteer who has an intended use for a property that is not listed in the residential, commercial or industrial land use categories below, may be able to apply the generic direct contact standards if the exposure assumptions which are determined for that property are consistent with exposure factor distributions used to calculate the generic direct-contact soil standards for one of the land use categories. The exposure factor distributions for the land use categories listed below are contained in the “Support Document for Generic Standards.” For example, if a volunteer has property where the intended land use is a nursery and the exposure assumptions are consistent with all of the industrial land use category exposure factor distributions contained in “Support Document for Generic Standards,” it would be appropriate for the volunteer to apply the industrial generic direct contact standards listed in paragraph (b)(3) of this rule.]

[Comment: if a volunteer has an intended use for a property which is listed in the residential, commercial or industrial land use categories below but the exposure assumptions which are determined for a portion of that property are not consistent with exposure factor distributions used to calculate the generic direct-contact soil standards for that land use category, the volunteer may divide the property into two (or more) properties and apply the appropriate generic direct contact standards to each property separately. For example, if a volunteer has a property that is a university where the land use exposure assumptions for the area where the dormitories are located are consistent with the residential exposure factor distributions and the land use exposure assumptions for the area where the teaching facilities are located

are consistent with the commercial exposure factor distributions, the volunteer may submit two no further action letters (one no further action letter for the dormitory area employing the residential standards and one no further action letter for the teaching facilities employing the commercial standards). in all situations where a volunteer chooses to assign different land uses to different portions of a property, each different land use will be considered a separate property for purposes of the voluntary action program and a separate no further action letter must be prepared for that portion.]

(i) Residential land use category.

Residential land use is land use with a high frequency of potential exposure of adults and children to dermal contact with soil, inhalation of vapors and particles from soil and ingestion of soil. the current or intended uses of the property includes, but is not limited to housing, education, or long-term health care for adults, children, the elderly, or the infirm, where exposure routes to soil from the property are reasonably anticipated to exist. Examples of residential land uses include, but are not limited to: residences; day care facilities; schools, colleges and other educational institutions; nursing homes, elder care and other long-term health care facilities; and correctional facilities.

[Comment: the exposure factor distributions used to calculate the generic direct-contact soil standards for Residential land use are contained in the “support Document for Generic Standards.”]

(ii) Commercial land use category. Commercial land use is land use with potential exposure of adult workers during a business day and potential exposures of adults and children who are customers, patrons or visitors to such facilities. Commercial land use includes potential exposure of adults to dermal contact with soil, inhalation of vapors and particles from soil and ingestion of soil. Exposures to soil on the property must be short and infrequent. The current or intended use of the property includes, but is not limited to facilities which supply goods or services and are open to the public. examples of commercial land uses include, but are not limited to: warehouses; building supply facilities; retail gasoline stations; automobile service stations; automobile dealerships; retail warehouses; repair and service establishments for appliances and other goods, professional offices; banks and credit unions; office buildings; retail businesses selling food or merchandise; hospitals and clinics; religious institutions; hotels; motels; personal service

establishments; and parking facilities.

[Comment: the exposure factor distributions used to calculate the generic direct-contact soil standards for commercial land use are contained in the “Support Document for Generic Standards.”]

(iii) Industrial land use category.

Industrial land use is land use with exposure of adult workers during a business day. Industrial land use must reliably exclude the general public and children from access to the facility. Industrial land use involves potential exposure of adults to dermal contact with soil, inhalation of vapors and particles from soil and ingestion of soil. The current or intended use for the property includes, but is not limited to, transportation or the manufacture or assembly of goods such as parts, machines or chemicals. Examples of industrial land uses include, but are not limited to: lumberyards; power plants; manufacturing facilities such as metal-working shops, plating shops, blast furnaces, coke plants, oil refineries, brick factories, chemical plants and plastics plants; assembly plants; non-public airport areas; limited access highways; railroad switching yards and marine port facilities.

[Comment: the exposure factor distributions used to calculate the generic direct-contact soil standards for industrial land use are contained in the “Support Document for Generic Standards.”]

(d) Point of compliance.

A volunteer or owner, if different from the volunteer, must meet and maintain compliance with the applicable generic direct-contact soil standards to a depth where it is reasonably anticipated that surficial soils will be made available for direct-contact through excavation, grading, drilling or other circumstances. The following minimum soil depths to which the generic direct-contact soil standards apply are as follows:

- (i) For the residential land use category, the generic direct-contact soil standards listed in paragraph (B)(3) of this rule apply to chemical(s) of concern that are present in soils from the surface to a minimum depth of ten feet. the volunteer or owner, if different from the volunteer, must comply with generic direct-contact soil standards at depths below ten feet when it is reasonably anticipated that soils will be made available for chronic direct-contact exposure through excavation, grading, drilling or other circumstances.

- (ii) For both the commercial and industrial land use categories, the generic direct-contact soil standards listed in paragraph (B)(3) of this rule apply to chemical(s) of concern in the soils from the surface to a minimum depth of two feet. The volunteer or owner, if different from the volunteer, must comply with generic direct-contact soil standards at depths below two feet when it is reasonably anticipated that soils will be made available for chronic direct-contact exposure through excavation, grading, drilling or other circumstances.

[Comment: the point of compliance for soils on a property is a minimum of two feet for industrial and commercial property and a minimum of ten feet for residential property unless soils below these depths are brought to the surface and left on the surface for a period of time long enough that the exposure to any chemical of concern contained in that soil would be determined to be chronic rather than acute. the no further action letter and any covenant not to sue issued for a property must specify the appropriate point of compliance. owners, operators, employees, residents, potential purchasers or other persons who may use the property should be aware that soils below these minimum depths of compliance have not necessarily been characterized and determined to meet generic direct-contact soil standards even though a voluntary action has been completed at the property.]

(3) Generic direct-contact soil standards.

(a) Petroleum standards.

(i) Residential or commercial land use petroleum standards.

The generic direct-contact soil standards for petroleum at commercial or residential properties will be the standards established in paragraphs (E)(3) and (E)(4) of rule 1301:7-9-13 of the Administrative Code.

(ii) Industrial land use petroleum standards.

The generic direct-contact soil standards for total petroleum hydrocarbons at industrial properties must be determined by the following method:

- (A) If the total petroleum hydrocarbons in the soils on the property come from light petroleum fractions, such as natural gasoline, gasohol and naphtha solvents, the soils on the property must be analyzed for *n*-hexane, benzene, toluene, ethylbenzene, total xylenes and

lead. The soils on the property must meet the generic direct-contact soil standards, listed in Table IV of this rule, for the above chemicals. In addition, the total petroleum hydrocarbon concentration in the soils on the property must not exceed the residual soil saturation concentration listed in Table I of this paragraph for the property-specific soil type and petroleum fraction; or

- (B) If the total petroleum hydrocarbons in the soils on the property come from middle petroleum fractions, such as kerosene, diesel fuel and jet fuel, the soils on the property must be analyzed for benzene, toluene, ethylbenzene, total xylenes, naphthalene, benzo[A]anthracene, benzo[B]fluoranthene, benzo[K]fluoranthene, chrysene, dibenzo[a,h]anthracene, indeno[1,2,3-cd]pyrene, acenaphthene, anthracene, flouranthene, fluorene and pyrene. the soils on the property must meet the generic direct-contact soil standards, listed in Table IV of this rule, for the above chemicals. in addition, the total petroleum hydrocarbon concentration in the soils on the property must not exceed the residual saturation concentration listed in Table I of this paragraph for the property-specific soil type and petroleum fraction; or
- (C) If the total petroleum hydrocarbons in the soils on the property come from heavy petroleum fractions, such as hydraulic oil, lube oil, and residual fuel oils, the soils on the property must be analyzed for benzo[A]anthracene, benzo[B]fluoranthene, benzo[K]fluoranthene, chrysene, dibenzo[A,H]anthracene, indeno[1,2,3-cd]pyrene, acenaphthene, anthracene, flouranthene, fluorene and pyrene. the soils on the property must meet the generic direct-contact soil standards, listed in Table IV of this rule, for the above chemicals. in addition, the total petroleum hydrocarbon concentration in the soils on the property must not exceed the residual saturation concentration listed in Table I of this paragraph for the property-specific soil type and petroleum fraction.
- (D) If the total petroleum hydrocarbons in the soils on the property come from an unknown source, the soils on the property must be analyzed for benzene, ethylbenzene, toluene, total xylenes, lead, *N*-hexane, naphthalene, benzo[A]anthracene, benzo[B]fluoranthene, benzo[K]fluoranthene, chrysene, dibenzo[a,h]anthracene, indeno[1,2,3-CD]pyrene, acenaphthene, anthracene, flouranthene, fluorene and

pyrene. The soils on the property must meet the generic direct-contact soil standards, listed in Table IV of this rule, for the above chemicals. In addition, the total petroleum hydrocarbon concentration in the soils on the property must not exceed the residual saturation concentration listed in Table I of this paragraph for the property-specific soil type and the lightest petroleum fraction present on the property.

- (E) The total petroleum hydrocarbon saturation concentrations must be determined for the industrial property by determining the vertical hydraulic conductivity of the unsaturated soil and applying the residual saturation concentration, contained in Table I of this paragraph that corresponds to the property -specific petroleum fraction. The residual saturation concentrations contained in Table I below are based on residual soil saturation with additional consideration for the toxicity of the uncharacterized portion of total petroleum hydrocarbon.

[Comment: for example, if the source of petroleum contamination is from a light petroleum fraction, such as gasoline, and the soils on the property are determined to have a vertical hydraulic conductivity (K_V) of 10^{-3} CM/S then, in addition to meeting the industrial generic direct-contact soil standards for benzene, ethylbenzene, toluene, total xylenes and *N*-hexane, the total petroleum hydrocarbon concentration must not exceed one thousand mg/kg.]

Table I: “Total Petroleum Hydrocarbon Soil Saturation Concentration” (values are in MG/KG).

Petroleum Fraction	Residual Saturation Concentrations for: Sand and Gravel; Unknown Soil Type $K_V: 10^{-3} - 10^{-4}$ CM/S	Residual Saturation Concentrations for: Silty/Clayey Sand $K_V: 10^{-4} - 10^{-5}$ CM/S	Residual Saturation Concentrations for: Glacial Till and Silty Clay $K_V: < 10^{-5}$ CM/S
Light (C ₄ -C ₁₂)	1,000	5,000	8,000
Middle (C ₇ -C ₁₆)	2,000	10,000	20,000

Heavy (C ₁₆ -C ₃₂)	5,000	20,000	40,000
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Where: “MG/KG” means milligrams per kilogram, “K_v” means vertical hydraulic conductivity of the unsaturated soil, “CM/S” means centimeters per second, and “c_x” means carbon chain length.

(b) Reporting limits for certified laboratories.

The volunteer must determine that the certified laboratory, which performs analyses that form the basis for the issuance of a further action letter, is capable of detecting the chemical(s) of concern on the property at or below the applicable generic direct-contact soil standards. the volunteer should contact the certified laboratory that is conducting analyses in support of the voluntary action to determine if the cleanup standards contained in paragraph (B)(3) of this rule are within the laboratory's reporting limits. in addition, the volunteer should be aware that even if the standards contained in paragraph (B)(3) of this rule are within the certified laboratory's reporting limits, the actual cleanup levels that must be met at a property may be lower if multiple chemicals of concern exist at the property. Properties with multiple chemicals of concern must perform a cumulative adjustment following the procedure contained in paragraph (B)(2)(b) of this rule. The volunteer must ensure that the cleanup levels after performing this cumulative adjustment are not below the certified laboratory's reporting limits.

(c) **Table II: “Generic Direct-Contact Soil Standards for Carcinogenic and Noncarcinogenic Chemicals of Concern - Residential Land Use Category” (values are in MG/KG).**

CHEMICAL OF CONCERN	SINGLE CHEMICAL NONCARCINOGENS	SINGLE CHEMICAL CARCINOGENS	SOIL SATURATION *	SINGLE CHEMICAL GENERIC DIRECT CONTACT STANDARD
VOLATILE ORGANIC CHEMICALS				
Acetone	4,500.00		100,000.00	4,500.00
Benzene	8.20	18.00	900.00	8.20
Carbon Tetrachloride	1.80	6.50	990.00	1.80
1,1 Dichloroethane	620.00		2,300.00	620.00
1,2 Dichloroethane		9.60	2,900.00	9.60
1,1 Dichlorethene	410.00	1.50	1,600.00	1.50
<i>trans-1,2 Dichloroethene</i>	910.00		2,500.00	910.00
<i>cis-1,2 Dichloroethene</i>	450.00		1,200.00	450.00
Ethylbenzene	1,500.00		230.00	230.00
<i>n-Hexane</i>	110.00		200.00	110.00

Methylene Chloride (Dichloromethane)	1,600.00	220.00	2,300.00	220.00
Methyl Ethyl Ketone	6,600.00		27,000.00	6,600.00
Methyl Iso-Butyl Ketone	440.00		3,800.00	440.00
Styrene	4,200.00		1,700.00	1,700.00
Tetrachloroethene (PCE)	450.00	94.00	370.00	94.00
Toluene	660.00		520.00	520.00
1,1,1-Trichloroethane	1,200.00		1,400.00	1,200.00
Trichloroethene (TCE)	270.00	77.00	820.00	77.00
Vinyl Chloride		0.58	1,200.00	0.58
Total Xylenes	87,000.00		1,500.00	1,500.00
SEMI-VOLATILE ORGANIC COMPOUNDS				
Acenaphthene	1,900.00			1,900.00
Anthracene	9,500.00			9,500.00
Benzo(a)anthracene		5.50		5.50
Benzo(b)fluoranthene		5.50		5.50
Benzo(k)fluoranthene		55.00		55.00
Benzo(a)pyrene		0.55		0.55
Bis (2-ethylhexyl) phthalate	390.00	150.00	31,000.00	150.00
Chrysene		550.00		550.00
Dibenzo(a,h)anthracene		0.55		0.55
Fluoranthene	1,300.00			1,300.00
Fluorene	1,300.00			1,300.00
Indeno(1,2,3-cd)pyrene		5.50		5.50
Naphthalene	1,800.00			1,800.00
Phenol	26,000.00			26,000.00
Pyrene	950.00			950.00
INORGANIC COMPOUNDS				
Arsenic	22.00	6.90		6.90
Barium	5,000.00			5,000.00
Cadmium	32.00	43,000.00		32.00
Chromium(III)	8,800.00			8,800.00
Chromium(VI)	230.00	6,400.00		230.00
Mercury	16.00			16.00
Nickel (soluble salts)	450.00			450.00
Zinc	19,000.00			19,000.00

(d) Table III: “Generic Direct-Contact Soil Standards for Carcinogenic and Noncarcinogenic Chemicals of Concern - Commercial Land Use Category” (values are in MG/KG).

CHEMICAL OF CONCERN	SINGLE CHEMICAL NONCARCINOGENS	SINGLE CHEMICAL CARCINOGENS	SOIL SATURATION *	SINGLE CHEMICAL GENERIC DIRECT CONTACT STANDARD
VOLATILE ORGANIC CHEMICALS				
Acetone	59,000.00		100,000.00	59,000.00
Benzene	68.00	76.00	900.00	68.00
Carbon Tetrachloride	15.00	28.00	990.00	15.00
1,1 Dichloroethane	5,400.00		2,300.00	2,300.00
1,2 Dichloroethane		41.00	2,900.00	41.00
1,1 Dichlorethene	5,300.00	6.40	1,600.00	6.40
<i>trans-1,2 Dichloroethene</i>	12,000.00		2,500.00	2,500.00
<i>cis-1,2 Dichloroethene</i>	5,900.00		1,200.00	1,200.00
Ethylbenzene	13,000.00		230.00	230.00
<i>n-Hexane</i>	950.00		200.00	200.00
Methylene Chloride (Dichloromethane)	17,000.00	1,000.00	2,300.00	1,000.00
Methyl Ethyl Ketone	58,000.00		27,000.00	27,000.00
Methyl Iso-Butyl Ketone	3,800.00		3,800.00	3,800.00
Styrene	41,000.00		1,700.00	1,700.00
Tetrachloroethene (PCE)	5,900.00	490.00	370.00	370.00
Toluene	5,500.00		520.00	520.00
1,1,1-Trichloroethane	9,700.00		1,400.00	1,400.00
Trichloroethene (TCE)	3,500.00	330.00	820.00	330.00
Vinyl Chloride		2.60	1,200.00	2.60
Total Xylenes	1,000,000.00		1,500.00	1,500.00
SEMI-VOLATILE ORGANIC COMPOUNDS				
Acenaphthene	19,000.00			19,000.00
Anthracene	94,000.00			94,000.00
Benzo(a)anthracene		32.00		32.00
Benzo(b)fluoranthene		32.00		32.00

Benzo(k)fluoranthene		320.00		320.00
Benzo(a)pyrene		3.20		3.20
Bis (2-ethylhexyl) phthalate	3,200.00	870.00	31,000.00	870.00
Chrysene		3,200.00		3,200.00
Dibenzo(a,h)anthracene		3.20		3.20
Fluoranthene	13,000.00			13,000.00
Fluorene	13,000.00			13,000.00
Indeno(1,2,3-cd)pyrene		32.00		32.00
Naphthalene	24,000.00			24,000.00
Phenol	320,000.00			320,000.00
Pyrene	9,400.00			9,400.00
INORGANIC COMPOUNDS				
Arsenic	720.00	110.00		110.00
Barium	160,000.00			160,000.00
Cadmium	310.00	180,000.00		310.00
Chromium(III)	65,000.00			65,000.00
Chromium(VI)	2,900.00	26,000.00		2,900.00
Mercury	250.00			250.00
Nickel (soluble salts)	3,800.00			3,800.00
Zinc	420,000.00			420,000.00

(e) Table IV: “Generic Direct-Contact Soil Standards for Carcinogenic and Noncarcinogenic Chemicals of Concern - Industrial Land Use Category”: (values in MG/KG).

CHEMICAL OF CONCERN	SINGLE CHEMICAL NONCARCINOGENS	SINGLE CHEMICAL CARCINOGENS	SOIL SATURATION *	SINGLE CHEMICAL GENERIC DIRECT CONTACT STANDARD
VOLATILE ORGANIC CHEMICALS				
Acetone	55,000.00		100,000.00	55,000.00
Benzene	68.00	75.00	900.00	68.00
Carbon Tetrachloride	15.00	28.00	990.00	15.00
1,1 Dichloroethane	5,400.00		2,300.00	2,300.00
1,2 Dichloroethane		41.00	2,900.00	41.00
1,1 Dichlorethene	5,000.00	6.30	1,600.00	6.30

<i>trans-1,2 Dichloroethene</i>	11,000.00		2,500.00	2,500.00
<i>cis-1,2 Dichloroethene</i>	5,500.00		1,200.00	1,200.00
Ethylbenzene	13,000.00		230.00	230.00
<i>n-Hexane</i>	960.00		200.00	200.00
Methylene Chloride (Dichloromethane)	16,000.00	990.00	2,300.00	990.00
Methyl Ethyl Ketone	58,000.00		27,000.00	27,000.00
Methyl Iso-Butyl Ketone	3,800.00		3,800.00	3,800.00
Styrene	41,000.00		1,700.00	1,700.00
Tetrachloroethene (PCE)	5,500.00	480.00	370.00	370.00
Toluene	5,600.00		520.00	520.00
1,1,1-Trichloroethane	9,800.00		1,400.00	1,400.00
Trichloroethene (TCE)	3,300.00	330.00	820.00	330.00
Vinyl Chloride		2.50	1,200.00	2.50
Total Xylenes	1,000,000.00		1,500.00	1,500.00
SEMI-VOLATILE ORGANIC COMPOUNDS				
Acenaphthene	18,000.00			18,000.00
Anthracene	89,000.00			89,000.00
Benzo(a)anthracene		31.00		31.00
Benzo(b)fluoranthene		31.00		31.00
Benzo(k)fluoranthene		310.00		310.00
Benzo(a)pyrene		3.10		3.10
Bis (2-ethylhexyl) phthalate	3,100.00	860.00	31,000.00	860.00
Chrysene		3,100.00		3,100.00
Dibenzo(a,h)anthracene		3.10		3.10
Fluoranthene	12,000.00			12,000.00
Fluorene	12,000.00			12,000.00
Indeno(1,2,3-cd)pyrene		31.00		31.00
Naphthalene	22,000.00			22,000.00
Phenol	300,000.00			300,000.00
Pyrene	8,900.00			8,900.00
INORGANIC COMPOUNDS				
Arsenic	610.00	86.00		86.00
Barium	140,000.00			140,000.00
Cadmium	300.00	170,000.00		300.00
Chromium(III)	63,000.00			63,000.00

Chromium(VI)	2,800.00	26,000.00	2,800.00
Mercury	230.00		230.00
Nickel (soluble salts)	3,700.00		3,700.00
Zinc	370,000.00		370,000.00

* The soil saturation concentrations are calculated using the U.S. EPA recommended soil saturation equation listed below. U.S. EPA does not recommend using this equation for compounds which are at solid phase at ambient soil temperatures; therefore, no generic soil saturation values were calculated for inorganic compounds, polycyclic aromatic hydrocarbons, naphthalene or phenol. The volunteer may use the equation below, along with property-specific information, to calculate a property-specific soil saturation concentration in lieu of the generic soil saturation concentrations listed in Tables II through IV of this paragraph.

(f) Calculating property-specific soil saturation concentrations.

(i) In lieu of using the generic soil saturation concentrations listed in Tables II through IV of this paragraph, the volunteer may use the following equation to calculate a property-specific soil saturation concentration:

(ii) The source for all chemical-specific values for the above equation must be obtained from one the following sources:

(a) U.S. EPA, "Soil Screening Guidance: Technical Background Document." publication 9355.4-17A, May, 1996;

(B) "Support Document for Generic Standards;"

(C) U.S. EPA. 1995. "Supplemental Technical Support Document for the Hazardous Waste Identification Rule: Risk Assessment for Human and Ecological Receptors Volumes 1 and 2," RTI, November 1995;

(D) U.S. EPA. 1995. "Technical Support Document for the Hazardous Waste Identification Program: Risk Assessment for Human and Ecological Receptors, Volumes 1 and 2," RTI, August 1995; or

(E) If chemical-specific values for the above equation are not available in the sources listed in paragraphs (B)(3)(f)(ii)(a) to (B)(3)(f)(ii)(d) of this rule, an Ohio EPA Division of Emergency and Remedial Response representative; and

(iii) Physical values must be obtained from one of the following sources:

(A) Property specific data that meet the criteria contained in paragraph (D)(3)(b)(iv) of rule 3745-300-09 of the Administrative Code, the risk assessment rule; or

(B) The soil saturation physical input default values are as follows:

P_D (dry soil bulk density) = 1.5 KG/L

Θ_W (water-filled soil porosity) = 0.15 (unitless)

F_{OC} (fraction organic carbon of soil) = 0.006 (unitless)

Θ_A (air-filled soil porosity) = 0.28 (unitless)

P_S (soil particle density) = 2.65 KG/L

N /total soil porosity = 0.43 (unitless)

(g) **Table V: “The Generic Direct-Contact Standards for Polychlorinated Biphenyls (hereinafter “PCBS” or “PCB”)” - (values are in MG/KG).**

	Residential Land use	Commercial Land Use	Industrial Land Use
Total PCBS	1	1	25

The total PCB standards contained in the table above take into account other factors and assumptions in addition to the carcinogenic or non-carcinogenic risk of the total PCBS. therefore, using the cumulative risk adjustment equations contained in paragraph (B)(2)(b) of this rule is not appropriate and is not required to be performed; however, the cumulative risk adjustment conducted in accordance with paragraph (B)(2)(b) of this rule must be performed for all other chemical(s) of concern listed in the tables contained in paragraphs (B)(3)(a)(ii), (B)(3)(c), (B)(3)(d) and (B)(3)(e) of this rule. the point of compliance in paragraph (B)(2)(d) of this rule applies to PCBS at a voluntary property.

[Comment: these values comport with the federal PCB spill cleanup policy. for commercial or residential land uses, the PCB spill cleanup policy does allow for 10 ppm of total PCBS to remain at the property, so long as a minimum of 10 inches of soil cover not exceeding 1 ppm total PCBS is maintained on the property. this higher cleanup level requires proper operation and maintenance of the soil cover and, therefore, would require the volunteer to follow the procedures of a property-specific risk assessment under the risk assessment rule instead of the procedures under this rule. these values should only be applied when the chemicals of concern in the identified

area(s) are PCBS. using these values to address mixtures containing PCBS and other chemicals of concern is not appropriate]

(h) Table VI: “The Generic Direct-Contact Standards for Lead” (Values are in MG/KG).

	Residential Land Use	Commercial Land Use	Industrial Land Use
Lead	400	1200	2800

The lead standards contained in the table above take into account other factors and assumptions in addition to the carcinogenic or non-carcinogenic risk of lead. therefore, using the cumulative risk adjustment equations contained in paragraph (B)(2)(b) of this rule is not appropriate and is not required to be performed; however, the cumulative risk adjustment conducted in accordance with paragraph (B)(2)(b) of this rule must be performed for all other chemicals of concern listed in the tables contained in paragraphs (B)(3)(a)(ii), (B)(3)(c), (B)(3)(d) and (B) (3)(e) of this rule . the point of compliance in paragraph (B)(2)(d) of this rule applies to lead at a voluntary property.

(4) Applicable standards.

If the volunteer elects to apply the direct contact soil standards contained in this rule, applicable standards for the direct-contact soils on the property are met if the concentration of any chemical of concern in the surface soils on the property, as determined in accordance with paragraph (D)(5) of rule 3745-300-07 of the Administrative Code, the “Phase II rule”, meets the generic direct-contact soil standard concentration(s) set forth in paragraph (B)(3) of this rule and is consistent with the assumptions set forth in paragraph (B)(2)(b) of this rule for the intended land use

[Comment: the volunteer may elect to apply standards for the direct contact soils on the property other than the generic direct contact soil standards contained in this rule provided that those standards are applicable to the property. for example, a volunteer may choose to determine risk derived standards for the direct contact soils on the property following the procedures contained in the property-specific risk assessment rule or may determine that the chemicals of concern are below background levels following the background determination procedures contained in the “Phase II Property Assessment” rule.]

(C) Generic unrestricted potable use standards for ground water.

(1) Applicability.

(a) The generic unrestricted potable use standards contained in paragraph (C)(3) of this rule apply as determined in accordance with rule 3745-300-10 of the Administrative Code, the ground water classification rule.

(b) If the ground water on, underlying or emanating from the property is used for activities other than drinking, showering, bathing or cooking, and those exposures are required to be evaluated under rule 3745-300-10 of the Administrative Code, the ground water classification rule, a property-specific risk assessment must be conducted following the procedures established in rule 3745-300-09 of the Administrative Code, the risk assessment rule, to determine applicable standard(s) for the intended use of the ground water on, underlying or emanating from the property.

[Comment: because many of the generic unrestricted potable use standards in Table VII of this rule are maximum contaminant levels (MCLS) which take into account other factors and assumptions in addition to the carcinogenic and non-carcinogenic risk of the chemical, cumulative risk adjustments need not be performed. therefore, the "Generic Unrestricted Potable Use Standard" column in Table VII of this rule contains the applicable generic unrestricted potable use standards for each chemical of concern for the property regardless of the number of chemical(s) of concern identified in the ground water underlying the property.]

(c) The generic unrestricted potable use standards for petroleum at commercial or residential properties are the standards established in paragraphs (E)(3) and (E)(4) of rule 1301:7-9-13 of the Administrative Code.

(d) A property-specific risk assessment conducted in accordance with the procedures established in rule 3745-300-09 of the Administrative Code, must be employed if the chemical(s) of concern on the property are not listed in Table VII of this rule.

(e) If institutional or engineering controls are used to meet applicable standards for the ground water underlying or emanating from the property, a property-specific risk assessment must be conducted following the procedures established in rule 3745-300-09 of the Administrative Code, the risk assessment rule to demonstrate that applicable standards have been met for the ground water underlying or emanating from the property.

(2) Assumptions.

The generic unrestricted potable use standards contained in Table VII at paragraph (C)(3)(c) of this rule were calculated using the assumption that the ground water underlying the property will be used as a source of water for drinking, cooking, showering

and bathing.

(3) The generic unrestricted potable use standards for ground water.

(a) The generic unrestricted potable use standards for petroleum, for residential and commercial properties are contained in paragraph (C)(1)(c) of this rule.

(b) The volunteer should contact the certified laboratory that is conducting analyses in support of the voluntary action to determine if the cleanup standards contained in Table VII of this rule are within the laboratory's reporting limits. the volunteer must determine that the certified laboratory, which performs analyses which forms the basis for the issuance of a no further action letter, is capable of detecting the chemical(s) of concern on the property at or below the applicable generic unrestricted potable use standards.

(c) **Table VII: “Generic Unrestricted Potable Use Standards” (values in µg/L, or micrograms per liter).**

CHEMICAL OF CONCERN	NONCARCINOGENS	CARCINOGENS	MCL	GENERIC UNRESTRICTED POTABLE USE STANDARD
VOLATILE ORGANIC CHEMICALS				
1,1,1-Trichloroethane			200	200
1,1,2-Trichloroethane			5.0	5.0
1,1-Dichloroethene			7.0	7.0
1,2,4-Trichlorobenzene			70	70
1,2-Dichloroethane			5.0	5.0
1,2-Dichloropropane			5.0	5.0
Benzene			5.0	5.0
Carbon Tetrachloride			5.0	5.0
<i>cis-1,2 Dichloroethene</i>			70	70
Dichloromethane (Methylene Chloride)			5.0	5.0

Ethylbenzene			700	700
Methyl Ethyl Ketone	8600			8600
Monochlorobenzene			100	100
<i>n</i> -Hexane	840			840
<i>o</i> -Dichlorobenzene			600	600
<i>p</i> -Dichlorobenzene			75	75
Styrene			100	100
Tetrachloroethene (PCE)			5.0	5.0
Toluene			1000	1000
Total Xylenes			1000 0	10000
<i>trans</i> -1,2 Dichlorethene			100	100
Trichloroethene (TCE)			5.0	5.0
Vinyl Chloride			2.0	2.0
INORGANIC COMPOUNDS				
Antimony			6.0	6.0
Arsenic			50	50
Asbestos			7*	7*
Barium			2000	2000
Beryllium			4.0	4.0
Cadmium			5.0	5.0
Chromium			100	100
Cyanide			200	200
Fluoride			4000	4000
Mercury			2.0	2.0
Nickel (soluble salts)			100	100
Nitrate (as N)			1000 0	10000
Nitrate-Nitrite (as N)			1000 0	10000
Nitrite (as N)			1000	1000
Selenium			50	50
Thallium			2.0	2.0
Zinc	4700			4700

(d) Point of compliance.

The point of compliance for the unrestricted potable use standards contained in this paragraph must be determined in accordance with rule 3745-300-10 of the Administrative Code, the ground water classification rule.

(e) Applicable standard.

If the volunteer elects to apply the generic unrestricted potable use standards contained in this rule, applicable standards for ground water are met when the concentration of any chemical(s) of concern in the ground water, as determined in accordance with paragraph (D)(5) of rule 3745-300-07 of the Administrative Code meets the unrestricted potable use standard concentration set forth in paragraph (C)(3) of this rule.

[Comment: the volunteer may elect to apply standards for the ground water on the property other than the generic unrestricted potable use standards contained in this rule provided that those standards are applicable to the property. for example, a volunteer may choose to determine risk-derived standards for the ground water on the property following the procedures contained in the property-specific risk assessment rule or may determine that the chemicals of concern are below background levels following the ground water background determination procedures contained in the “Phase II Property Assessment” rule.]

(D) Generic standards for surface water.

(1) All point source discharges of pollutants into the surface waters of the state, as defined in section 6111.01 of the Revised Code, and any other regulated discharges that occur from or on the property must comply with all permit or other applicable requirements of the Federal Water Pollution Control Act and Chapter 6111. of the Revised Code, and any regulations adopted thereunder.

[Comment: a volunteer may obtain a consolidated standards permit for activities conducted in connection with a voluntary action which require permits from the director.]

(2) Storm water associated with industrial activity that is discharged to the surface waters of the state or is discharged through a separate municipal storm sewer system must comply with the applicable requirements contained in 40 CFR 122.26.

(E) Standards for leaching to ground water

The leaching of hazardous substances or petroleum to ground water underlying the property must be addressed in accordance with rule 3745-300-10 of the Administrative Code.

[Comment: other obligations to address soil media may exist in addition to the obligation to address direct-contact with soils. when the groundwater classification rule (rule 3745-300-10 of the Administrative Code) requires that the leaching of hazardous substances and petroleum from soil to ground water be controlled and it is determined as a result of a “Phase II Property Assessment” that hazardous substances and petroleum are leaching or will leach to ground water, the volunteer must determine an applicable standard in

accordance the risk assessment rule. the volunteer may develop property-specific soil concentrations that ensure that leaching of hazardous substances or petroleum will not cause an applicable groundwater standard to be exceeded, in accordance with the risk assessment rule, or may use the chemical-specific leach based values contained in the guidance document, "Ohio EPA Derived Leach-Based Values," October, 1996, which prevent leaching above the generic potable ground water standards. these values may be used alone or, as appropriate, in concert with additional fate and transport models in accordance with the risk assessment rule. the "Ohio EPA Derived Leach-Based Values," October, 1996, guidance document is available upon request from the Ohio EPA, Division of Emergency and Remedial Response.]

(F) Generic numerical standards for sediment (reserved).

(G) Generic numerical soil standards for protection of ecological receptors (reserved).

Effective: _____

Certification: _____

Date: _____

Promulgated Under: RC Chapter 119.

Rule Amplified: RC Chapter 3746.

Rule Authorized By: RC Chapter 3746.

Prior Effective Dates: None