ENVIRONMENTAL PROTECTION

SITE REMEDIATION AND WASTE MANAGEMENT

Notice of Administrative Change

Remediation Standards

N.J.A.C. 7:26D Appendix 1, Tables 1A and 1B

Take notice that the New Jersey Department of Environmental Protection (Department) is changing Appendix 1, Tables 1A and 1B, of the Remediation Standards, N.J.A.C. 7:26D, in accordance with N.J.A.C. 7:26D-6.2, to update the soil remediation standards for 19 contaminants to reflect U.S. Environmental Protection Agency (USEPA) revisions to the carcinogenic (or cancer) slope factor or non-carcinogenic (or non-cancer) reference dose data for these compounds, contained in the Integrated Risk Information System (IRIS) (see www.epa.gov/iris) database, on which the soil remediation standards are based. The updated soil remediation standards are operative as of September 18, 2017. The updated soil remediation standards are also available on the Department's website at www.nj.gov/dep/rules/rules/njac7_26d.pdf.

The Remediation Standards at N.J.A.C. 7:26D-4.2 and 4.3 establish that the residential direct contact soil remediation standards and non-residential direct contact soil remediation standards are developed using the equations, data sources, and conventions set forth in N.J.A.C. 7:26D Appendix 2 and 3, respectively. In 2008, when the Department promulgated the Remediation Standards (see 39 N.J.R. 1574(a); 40 N.J.R. 3187(a)), the Department utilized the following hierarchy of toxicity data sources for the carcinogenic slope factor or the reference

dose for non-carcinogens: (1) information that forms the basis for drinking water standards adopted by the Department pursuant to the Safe Drinking Water Act, N.J.S.A. 58:12A-13; (2) IRIS; and (3) other pertinent health-based data.

For some contaminants, the calculated health-based criterion value was greater than one million parts per million. Because this cannot physically occur, the Department determined not to establish a numeric health-based criterion for those contaminants, which is reflected in Tables 1A and 1B as "NA" (standard not available). In addition, for some contaminants, the calculated inhalation exposure pathway health-based criterion value was greater than the soil saturation level for a given contaminant. The soil saturation level corresponds to the contaminant concentration in soil at which the absorptive limit of the soil particles, the solubility limit of the soil pore water, and saturation of soil pore air are reached. This means that, regardless of the concentration of the contaminant in soil, the calculated health-based criterion can never be exceeded and, therefore, a health-based criterion is not needed for the inhalation exposure pathway for those contaminants. The Department determined not to establish numeric inhalation soil criteria for contaminants for which the calculated health-based criterion is greater than the contaminant's soil saturation level, which is reflected in Tables 1A and 1B as NA. Further, there were no inhalation toxicity data available for some contaminants. However, if oral toxicity data were available for those contaminants, the Department converted the data to inhalation unit risk factors, a process known as route-to-route conversion.

In calculating these updated soil remediation standards, the Department used the same procedures used to establish the soil remediation standards promulgated in 2008.

N.J.A.C. 7:26D-4.2 establishes that, for each contaminant identified in N.J.A.C. 7:26D Appendix 1, Table 1A, the residential direct contact soil remediation standard is the more stringent of either the ingestion-dermal human health-based criterion or the inhalation human health-based criterion, or the PQL if the PQL is less stringent than the corresponding human health-based criterion. Similarly, N.J.A.C. 7:26D-4.3 establishes that, for each contaminant listed in N.J.A.C. 7:26D Appendix 1, Table 1B, the non-residential direct contact soil remediation standard is the more stringent of either the ingestion-dermal human health-based criterion or the inhalation human health-based criterion, or the PQL, if the PQL is less stringent than the corresponding human health-based criterion.

Updated Remediation Standards

Polycyclic aromatic hydrocarbons

Seven of the 19 contaminants for which the soil remediation standards are updated are polycyclic aromatic hydrocarbons, specifically, benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; dibenz(a,h)anthracene; and indeno(1,2,3-cd)pyrene. The IRIS information for benzo(a)pyrene was updated in January 2017. A reference dose, reference concentration, cancer slope factor, and inhalation unit risk factor were developed for benzo(a)pyrene. The IRIS database includes a document entitled "Toxicological Review of Benzo(a)pyrene." This document develops the cancer slope factor for the other six polycyclic aromatic hydrocarbons by multiplying the benzo(a)pyrene cancer slope factor by a relative potency factor that USEPA developed for the respective polycyclic aromatic hydrocarbons.

Benzo(a)anthracene

Using the 2017 IRIS cancer slope factor developed for the ingestion-dermal exposure pathway for benzo(a)pyrene adjusted by the relative potency factor for benzo(a)anthracene, the calculated soil criteria for benzo(a)anthracene are five milligrams per kilogram (mg/kg) for the residential exposure scenario, and 17 mg/kg for the non-residential exposure scenario. Using the 2017 IRIS inhalation unit risk factor developed for the inhalation exposure pathway for benzo(a)pyrene adjusted by the relative potency factor for benzo(a)anthracene, the calculated soil criteria for benzo(a)anthracene are 71,000 mg/kg for the residential exposure scenario and 5,500 mg/kg for the non-residential exposure scenario. The Department is updating the residential direct contact soil remediation standard for benzo(a)anthracene to five mg/kg and the non-residential direct contact soil remediation standard to 17 mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Benzo(a)pyrene

Using the 2017 IRIS cancer slope factor developed for the ingestion-dermal exposure pathway, the calculated soil criteria for benzo(a)pyrene are 0.5 mg/kg for the residential exposure scenario and two mg/kg for the non-residential exposure scenario. Using the 2017 IRIS inhalation reference concentration developed for the inhalation exposure pathway, the calculated soil criteria for benzo(a)pyrene are 3,600 mg/kg for the residential exposure scenario and 230 mg/kg for the non-residential exposure scenario. The Department is updating the residential direct contact soil remediation standard for benzo(a)pyrene to 0.5 mg/kg and the non-

residential direct contact soil remediation standard to two mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Benzo(b)fluoranthene

Using the 2017 IRIS cancer slope factor developed for the ingestion-dermal exposure pathway for benzo(a)pyrene adjusted by the relative potency factor for benzo(b)fluoranthene, the calculated soil criteria for benzo(b)fluoranthene are five mg/kg for the residential exposure scenario and 17 mg/kg for the non-residential exposure scenario. Using the 2017 IRIS inhalation unit risk factor developed for the inhalation exposure pathway for benzo(a)pyrene adjusted by the relative potency factor for benzo(b)fluoranthene, the calculated soil criteria for benzo(b)fluoranthene are 71,000 mg/kg for the residential exposure scenario and 5,500 mg/kg for the non-residential exposure scenario. The Department is updating the residential direct contact soil remediation standard for benzo(b)fluoranthene to five mg/kg and the non-residential direct contact soil remediation standard to 17 mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Benzo(k)fluoranthene

Using the 2017 IRIS cancer slope factor developed for the ingestion-dermal exposure pathway for benzo(a)pyrene adjusted by the relative potency factor for benzo(k)fluoranthene, the calculated soil criteria for benzo(k)fluoranthene are 45 mg/kg for the residential exposure

scenario and 170 mg/kg for the non-residential exposure scenario. Using the 2017 IRIS inhalation unit risk factor developed for the inhalation exposure pathway for benzo(a)pyrene adjusted by the relative potency factor for benzo(b)fluoranthene, the calculated soil criteria for benzo(b)fluoranthene are 710,000 mg/kg for the residential exposure scenario and 55,000 mg/kg for the non-residential exposure scenario. The Department is updating the residential direct contact soil remediation standard for benzo(b)fluoranthene to 45 mg/kg and the non-residential direct contact soil remediation standard to 170 mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Chrysene

Using the 2017 IRIS cancer slope factor developed for the ingestion-dermal exposure pathway for benzo(a)pyrene adjusted by the relative potency factor for chrysene, the calculated soil criteria for chrysene are 450 mg/kg for the residential exposure scenario and 1,700 mg/kg for the non-residential exposure scenario. Using the 2017 IRIS inhalation unit risk factor developed for the inhalation exposure pathway for benzo(a)pyrene adjusted by the relative potency factor for chrysene, a residential direct contact soil remediation criterion for chrysene was calculated. However, the calculated health-based criterion for the residential exposure scenario based on particulate inhalation is greater than one million parts per million, and the calculated health-based criterion based on volatile inhalation is greater than the soil saturation concentration. Accordingly, as explained above, a health-based criterion is not available for the residential inhalation exposure pathway for chrysene and is indicated NA in Table 1A. The calculated soil

criterion for chrysene for the non-residential exposure scenario is 550,000 mg/kg. The Department is updating the residential direct contact soil remediation standard for chrysene to 450 mg/kg and the non-residential direct contact soil remediation standard to 1,700 mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Dibenz(a,h)anthracene

Using the 2017 IRIS cancer slope factor developed for the ingestion-dermal exposure pathway for benzo(a)pyrene adjusted by the relative potency factor for dibenz(a,h)anthracene, the calculated soil criteria for dibenz(a,h)anthracene are 0.5 mg/kg for the residential exposure scenario and two mg/kg for the non-residential exposure scenario. Using the 2017 IRIS inhalation unit risk factor developed for the inhalation exposure pathway exposure scenario for benzo(a)pyrene adjusted by the relative potency factor for dibenz(a,h)anthracene, the calculated soil criteria for dibenz(a,h)anthracene are 7,100 mg/kg for the residential exposure scenario and 550 mg/kg for the non-residential exposure scenario. The Department is updating the residential direct contact soil remediation standard for dibenz(a,h)anthracene to 0.5 mg/kg and the non-residential direct contact soil remediation standard to two mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Indeno(1,2,3-cd)pyrene

Using the 2017 IRIS cancer slope factor developed for the ingestion-dermal exposure pathway for benzo(a)pyrene adjusted by the relative potency factor for indeno(1,2,3-cd)pyrene, the calculated soil criteria for indeno(1,2,3-cd)pyrene are five mg/kg for the residential exposure scenario and 17 mg/kg for the non-residential exposure scenario. Using the 2017 IRIS inhalation unit risk factor developed for the inhalation exposure pathway for benzo(a)pyrene adjusted by the relative potency factor for indeno(1,2,3-cd)pyrene, the calculated soil criteria for indeno(1,2,3-cd)pyrene are 71,000 mg/kg for the residential exposure scenario and 5,500 mg/kg for the non-residential exposure scenario. The Department is updating the residential direct contact soil remediation standards for indeno(1,2,3-cd)pyrene to five mg/kg and the non-residential direct contact soil remediation standard to 17 mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Non-polycyclic aromatic hydrocarbon contaminants

1,1-Biphenyl

The IRIS information for 1,1-biphenyl was updated in August 2013. A reference dose and cancer slope factor were developed for 1,1-biphenyl. Using the 2013 IRIS cancer slope factor developed for the ingestion-dermal exposure pathway, the calculated soil criteria for 1,1-biphenyl are 61 mg/kg for the residential exposure scenario and 240 mg/kg for the non-residential exposure scenario. The Department evaluated the inhalation exposure pathway by deriving an inhalation unit risk factor based on a route to route conversion of the 2013 IRIS cancer slope factor for 1,1-biphenyl. For the inhalation exposure pathway, a residential direct

contact soil remediation criterion for 1,1-biphenyl was calculated. However, the calculated health-based criterion for the residential exposure scenario based on particulate inhalation is greater than one million parts per million, and the calculated health-based criterion based on volatile inhalation is greater than the soil saturation concentration. Accordingly, as explained above, a health-based criterion is not available for the residential inhalation exposure pathway for 1,1-biphenyl and is indicated NA in Table 1A. This represents no change from the existing health-based criterion for 1,1-biphenyl for the residential inhalation exposure pathway. The calculated soil criterion for 1,1-biphenyl for the non-residential exposure scenario is 140,000 mg/kg. The Department is updating the residential direct contact soil remediation standard for 1,1-biphenyl to 61 mg/kg and the non-residential direct contact soil remediation standard to 240 mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Carbon tetrachloride

The IRIS information for trichloroethene was updated in March 2010. A reference dose, reference concentration, inhalation unit risk factor, and cancer slope factor were developed for carbon tetrachloride. Using the 2010 IRIS inhalation unit risk factor developed for the inhalation exposure pathway, the calculated soil criteria for carbon tetrachloride are two mg/kg for the residential exposure scenario and four mg/kg for the non-residential exposure scenario. For the ingestion-dermal exposure pathway, the soil remediation criteria for carbon tetrachloride remains at seven mg/kg for the residential exposure scenario and 35 mg/kg for the non-residential exposure scenario; pursuant to the hierarchy of toxicity data sources noted above, these two

criteria were calculated using toxicity information that forms the basis for the Department's drinking water standards. The Department is updating the residential direct contact soil remediation standard for carbon tetrachloride to two mg/kg and the non-residential direct contact soil remediation standard to four mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Cyanide

The IRIS information for cyanide was updated in September 2010. A reference dose was developed for cyanide. Using the 2010 IRIS reference dose developed for the ingestion-dermal exposure pathway, the calculated soil criteria for cyanide are 47 mg/kg for the residential exposure scenario and 680 mg/kg for the non-residential exposure scenario. The Department evaluated the inhalation exposure pathway by deriving a reference concentration based on a route-to-route conversion of the 2010 IRIS reference dose for cyanide. The Department calculated a residential direct contact soil remediation criterion for cyanide. However, the calculated health-based criterion for the residential exposure scenario based on particulate inhalation is greater than one million parts per million. Cyanide is non-volatile, so a health-based criterion based on volatile inhalation was not calculated. Accordingly, as explained above, a health-based criterion is not available for the residential inhalation exposure pathway for cyanide and is indicated NA in Table 1A. This represents no change from the existing health-based criterion for cyanide for the residential inhalation exposure pathway. The calculated soil criterion for the inhalation exposure pathway is 260,000 mg/kg for the non-residential exposure scenario. The Department is updating the residential direct contact soil remediation standard for

cyanide to 47 mg/kg and the non-residential direct contact soil remediation standard to 680 mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Hexachloroethane

The IRIS information for hexachloroethane was updated in September 2011. A reference dose, reference concentration, and cancer slope factor were developed for hexachloroethane. Using the 2011 IRIS cancer slope factor developed for the ingestion-dermal exposure pathway, the calculated soil criteria for hexachloroethane are 12 mg/kg for the residential exposure scenario and 48 mg/kg for the non-residential exposure scenario. For the inhalation exposure pathway, the Department used the 2011 reference concentration in developing a soil remediation standard for hexachloroethane. The Department calculated a residential direct contact soil remediation criterion for hexachloroethane. However, the calculated health-based criterion for the residential exposure scenario based on particulate inhalation is greater than one million parts per million, and the calculated health-based criterion based on volatile inhalation is greater than the soil saturation concentration. Accordingly, as explained above, a health-based criterion is not available for the residential inhalation exposure pathway for hexachloroethane and is indicated NA in Table 1A. The calculated soil criterion for the inhalation exposure pathway is 10,200 mg/kg for the non-residential exposure scenario. The Department is updating the residential direct contact soil remediation standard for hexachloroethane to 12 mg/kg and the non-residential direct contact soil remediation standard to 48 mg/kg, as these are the more stringent of the

respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Methylene chloride

The IRIS information for methylene chloride was updated in November 2011. A reference dose, reference concentration, cancer slope factor, and inhalation unit risk factor were developed for methylene chloride. Using the 2011 IRIS inhalation unit risk factor developed for the inhalation exposure pathway, the calculated soil criterion for methylene chloride is 1,600 mg/kg for the residential exposure scenario. The Department calculated a non-residential direct contact soil remediation criterion for methylene chloride. However, the calculated health-based criterion for the non-residential exposure scenario based on particulate inhalation is greater than one million parts per million, and the calculated health-based criterion based on volatile inhalation is greater than the soil saturation concentration. Accordingly, as explained above, a health-based criterion is not available for the non-residential inhalation exposure pathway for methylene chloride and is indicated NA in Table 1B. For the ingestion-dermal exposure pathway, the soil remediation criteria for methylene chloride remains at 46 mg/kg for the residential exposure scenario and 230 mg/kg for the non-residential exposure scenario; pursuant to the hierarchy of toxicity data sources noted above, these two criteria were calculated using toxicity information that forms the basis for the Department's drinking water standards. The Department is updating the residential direct contact soil remediation standard for methylene chloride to 46 mg/kg and the non-residential direct contact soil remediation standard to 230

mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Nitrobenzene

The IRIS information for nitrobenzene was updated in February 2009. A reference dose, reference concentration, and inhalation unit risk factor were developed for nitrobenzene. Using the 2009 IRIS reference dose developed for the ingestion-dermal exposure pathway, the calculated soil criteria for nitrobenzene are 120 mg/kg for the residential exposure scenario and 1,400 mg/kg for the non-residential exposure scenario. Using the 2009 IRIS inhalation unit risk factor developed for the inhalation exposure pathway, the calculated soil criteria for nitrobenzene are five mg/kg for the residential exposure scenario and 14 mg/kg for the non-residential exposure scenario. The Department is updating the residential direct contact soil remediation standard for nitrobenzene to five mg/kg and the non-residential direct contact soil remediation standard to 14 mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Pentachlorophenol

The IRIS information for pentachlorophenol was updated in September 2010. A reference dose and cancer slope factor were developed for pentachlorophenol. Using the 2010 IRIS cancer slope factor developed for the ingestion-dermal exposure pathway, the calculated soil criteria for pentachlorophenol are 0.9 mg/kg for the residential exposure scenario and three mg/kg for the non-residential exposure scenario. For the inhalation exposure pathway, the

calculated soil criteria for pentachlorophenol remains 590 mg/kg for the residential exposure scenario and 1,700 mg/kg for the non-residential exposure scenario, as there were no IRIS updates that affected the existing values. The Department is updating the residential direct contact soil remediation standard for pentachlorophenol to 0.9 mg/kg and the non-residential direct contact soil remediation standard to three mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

1,1,2,2-Tetrachloroethane

The IRIS information for 1,1,2,2-tetrachloroethane was updated in September 2010. A reference dose and cancer slope factor were developed for 1,1,2,2-tetrachloroethane, while the existing inhalation unit risk factor was withdrawn. The existing inhalation health-based criteria for 1,1,2,2-tetrachloroethane were based on the withdrawn inhalation unit risk factor. As part of these updates, the Department evaluated the inhalation exposure pathway by deriving an inhalation unit risk factor based on a route to route conversion of the 2010 IRIS cancer slope factor for 1,1,2,2-tetrachloroethane. Using this inhalation unit risk factor, the calculated soil criteria for 1,1,2,2-tetrachloroethane are one mg/kg for the residential exposure scenario and three mg/kg for the non-residential exposure scenario. The soil criteria calculated using this method are the same as the existing criteria derived using the withdrawn inhalation unit risk factor, and, thus, there is no change made in Tables 1A and 1B for the inhalation health-based criteria. Using the 2010 IRIS cancer slope factor developed for the ingestion-dermal exposure pathway, the calculated soil criteria for 1,1,2,2-tetrachloroethene are three mg/kg for the

residential exposure scenario and 16 mg/kg for the non-residential exposure scenario. The soil remediation standards, thus, remain the same as the existing soil remediation standards, that is, the residential direct contact soil remediation standard is one mg/kg and the non-residential direct contact soil remediation standard is three mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Tetrachloroethene

The IRIS information for tetrachloroethene was updated in February 2012. A reference dose, reference concentration, cancer slope factor, and inhalation unit risk factor were developed for tetrachloroethene. The Department evaluated the inhalation exposure pathway using the 2012 IRIS inhalation unit risk factor. The calculated soil criterion for tetrachloroethene is 43 mg/kg for the residential exposure scenario. The Department calculated a non-residential direct contact soil remediation criterion for tetrachloroethene. However, the calculated health-based criterion for the non-residential exposure scenario based on particulate inhalation is greater than one million parts per million, and the calculated health-based criterion based on volatile inhalation is greater than the soil saturation concentration. Accordingly, as explained above, a non-residential health-based criterion is not available for the inhalation exposure pathway for tetrachloroethene and is indicated NA in Table 1B. Using the 2012 IRIS cancer slope factor developed for the ingestion-dermal exposure pathway, the calculated soil criteria for tetrachloroethene are 300 mg/kg for the residential exposure scenario) and 1,500 mg/kg for the non-residential exposure scenario. The Department is updating the residential direct contact soil

remediation standard for tetrachloroethene to 43 mg/kg and the non-residential direct contact soil remediation standard to 1,500 mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Thallium

The IRIS information for thallium (as thallium sulfate) was updated in September 2009. The existing reference dose for thallium was withdrawn and USEPA found that there was inadequate toxicity information available. The Department's existing soil remediation standards for the ingestion-dermal exposure pathway (five mg/kg for the residential exposure scenario and 79 mg/kg for the non-residential exposure scenario) are based on the withdrawn reference dose. The existing soil remediation criteria for the inhalation exposure pathway, 360,000 mg/kg for the residential exposure scenario and 23,000 mg/kg for the non-residential exposure scenario, are based on a route-to-route conversion of the withdrawn reference dose. The Department determined, in accordance with hierarchy of toxicity data sources discussed above, that there are no other pertinent health-based data available to develop health-based criteria for thallium. Consequently, the Department is deleting the residential and non-residential soil remediation standards for thallium.

1,1,1-Trichloroethane

The IRIS information for 1,1,1-trichloroethane was updated in September 2007. A reference dose and a reference concentration were developed for 1,1,1-trichloroethane. Using the IRIS reference dose developed for the ingestion-dermal exposure pathway, the calculated soil

criterion for 1,1,1-trichloroethane is 160,000 mg/kg for the residential exposure scenario. The Department calculated a non-residential soil remediation criterion for 1,1,1-trichloroethane. However, the calculated health-based criterion for the non-residential exposure scenario is greater than one million parts per million. Accordingly, as explained above, a non-residential health-based criterion is not available for the ingestion-dermal exposure pathway for 1,1,1-trichloroethane and is indicated NA in Table 1B. Using the IRIS reference concentration for the inhalation exposure pathway, the calculated soil criterion for 1,1,1-trichloroethane is 22,000 mg/kg for the residential exposure scenario. The Department calculated a non-residential direct contact soil remediation criterion for 1,1,1-trichloroethane. However, the calculated health-based criterion for the non-residential exposure scenario based on particulate inhalation is greater than one million parts per million, and the calculated health-based criterion based on volatile inhalation is greater than the soil saturation concentration. Accordingly, as explained above, a non-residential health-based criterion is not available for the inhalation exposure pathway for 1,1,1-trichloroethane and is indicated NA in Table 1B. This represents no change from the existing health-based criterion for 1,1,1-trichloroethane for the non-residential inhalation exposure pathway. The Department is updating the residential direct contact soil remediation standard for 1,1,1-trichloroethane to 22,000 mg/kg, as that is the more stringent of the direct contact ingestion-dermal health-based criterion and the inhalation health-based criterion. The non-residential direct contact soil remediation standard is updated to NA (no standard available) because, as noted above, the calculated health-based criterion is either greater than one million parts per million or greater than the soil saturation level.

Trichloroethene

The IRIS information for trichloroethene was updated in September 2011. A reference dose, reference concentration, inhalation unit risk factor, and cancer slope factor were developed for trichloroethene. Using the 2011 IRIS inhalation unit risk factor developed for the inhalation exposure pathway, the calculated soil criteria for trichloroethene are three mg/kg for the residential exposure scenario and 10 mg/kg for the non-residential exposure scenario. Using the 2011 IRIS cancer slope factor developed for the ingestion-dermal exposure pathway, the calculated soil criteria for trichloroethene are 14 mg/kg for the residential exposure scenario) and 69 mg/kg for the non-residential exposure scenario. The Department is updating the residential direct contact soil remediation standard for trichloroethene to three mg/kg and the non-residential direct contact soil remediation standard to 10 mg/kg, as these are the more stringent of the respective direct contact ingestion-dermal health-based criteria and the inhalation health-based criteria.

Full text of the changed rules follows (additions indicated in boldface **thus**; deletions indicated in brackets [thus]):

APPENDIX 1

SOIL REMEDIATION STANDARDS TABLES

Table 1A – Residential Direct Contact Health Bbased Criteria and

Soil Remediation Standards (mg/kg)

Contaminant	CAS No.	Ingestion-Dermal Health Based Criterion	Inhalation Health Based Criterion	Soil PQL	Residential Direct Contact Soil Remediation Standard
...					
Benzo(a)anthracene (1,2-Benzanthracene)	56-55-3	[0.6] **5**	[38,000] **71,000**	0.2	[0.6] **5**
Benzo(a)pyrene	50-32-8	[0.06] **0.5**	[3,800] **3,600**	0.2	[0.2] **0.5**
Benzo(b)fluoranthene (3,4-Benzofluoranthene)	205-99-2	[0.6] **5**	[38,000] **71,000**	0.2	[0.6] **5**
...					
Benzo(k)fluoranthene	207-08-9	[6] **45**	[38,000] **710,000**	0.2	[6] **45**
...					
1,1[1]-Biphenyl	92-52-4	[3,100] **61**	NA	0.2	[3,100] **61**
...					

Carbon tetrachloride	56-23-5	7	[0.6] **2**	0.005	[0.6] **2**
..					
Chrysene	218-01-9	[62] **450**	[380,000] **NA**	0.2	[62] **450**
..					
Cyanide	57-12-5	[1,600] **47**	NA	3	[1,600] **47**
...					
Dibenz(a,h)anthracene	53-70-3	[0.06] **0.5**	[3,500] **7,100**	0.2	[0.2] **0.5**
...					
Hexachloroethane	67-72-1	[35] **12**	[83] **NA**	0.2	[35] **12**
Indeno(1,2,3-cd)pyrene	193-39-5	[0.6] **5**	[38,000] **71,000**	0.2	[0.6] **5**
...					
Methylene chloride (Dichloromethane)	75-09-2	46	[34] **1,600**	0.005	[34] **46**
...					
Nitrobenzene	98-95-3	[31] **120**	[160] **5**	0.2	[31] **5**
...					
Pentachlorophenol	87-86-5	[3] **0.9**	590	0.3	[3] **0.9**
...					
1,1,2,2-Tetrachloroethane	79-34-5	[10] **3**	1	0.005	1

Tetrachloroethene (PCE) (Tetrachloroethylene)	127-18-4	[8] **300**	[2] **43**	0.005	[2] **43**
[Thallium	7440-28-0	5	360,000	3	5]
...					
1,1,1-Trichloroethane	71-55-6	[290] **160,000**	[NA] **22,000**	0.005	[290] **22,000**
...					
Trichloroethene (TCE) (Trichloroethylene)	79-01-6	[21] **14**	[7] **3**	0.005	[7] **3**
...					

NA = Standard not available

* The direct contact standard for arsenic is based on natural background

Table 1B – Non-Residential Direct Contact Health Bbased Criteria and

Soil Remediation Standards (mg/kg)

Contaminant	CAS No.	Ingestion-Dermal Health Based Criterion	Inhalation Health Based Criterion	Soil PQL	Non-Residential Direct Contact Soil Remediation Standard
...					
Benzo(a)anthracene (1,2-Benzanthracene)	56-55-3	[2] **17**	[3,000] **5,500**	0.2	[2] **17**
Benzo(a)pyrene	50-32-8	[0.2] **2**	[300] **230**	0.2	[0.2] **2**
Benzo(b)fluoranthene (3,4-Benzofluoranthene)	205-99-2	[2] **17**	[3,000] **5,500**	0.2	[2] **17**
...					
Benzo(k)fluoranthene	207-08-9	[23] **170**	[3,000] **55,000**	0.2	[23] **170**

...					
1,1[1]-Biphenyl	92-52-4	[34,000] **240**	[NA] **140,000**	0.2	[34,000] **240**
...					
Carbon tetrachloride	56-23-5	35	[2] **4**	0.005	[2] **4**
...					
Chrysene	218-01-9	[230] **1,700**	[30,000] **550,000**	0.2	[230] **1,700**
...					
Cyanide	57-12-5	[23,000] **680**	[NA] **260,000**	3	[23,000] **680**
...					
Dibenz(a,h)anthracene	53-70-3	[0.2] **2**	[270] **550**	0.2	[0.2] **2**
...					
Hexachloroethane	67-72-1	[140] **48**	[82,000] **10,200**	0.2	[140] **48**
Indeno(1,2,3-cd)pyrene	193-39-5	[2] **17**	[3,000] **5,500**	0.2	[2] **17**
...					
Methylene chloride (Dichloromethane)	75-09-2	230	[97] **NA**	0.005	[97] **230**

...					
Nitrobenzene	98-95-3	[340] **1,400**	[390] **14**	0.2	[340] **14**
...					
Pentachlorophenol	87-86-5	[10] **3**	1,700	0.3	[10] **3**
...					
1,1,2,2-Tetrachloroethane	79-34-5	[150] **16**	3	0.005	3
Tetrachloroethene (PCE) (Tetrachloroethylene)	127-18-4	[39] **1,500**	[5] **NA**	0.005	[5] **1,500**
[Thallium	7440-28-0	79	23,000	3	79]
...					
1,1,1-Trichloroethane	71-55-6	[4,200] **NA**	NA	0.005	[4,200] **NA**
...					
Trichloroethene (TCE) (Trichloroethylene)	79-01-6	[100] **69**	[20] **10**	0.005	[20] **10**
...					