**Section 808.APPENDIX B Toxicity Hazard**

This Appendix describes the method by which a generator of special waste or the waste source shall determine the toxic score for a waste.

a) The wastestream equivalent toxic concentration (Ceq) is calculated as follows:

Ceq = A \* SUM(Ci / Bi \* Ti)

where:

1) SUM means the sum of the results of the calculation in parentheses for each component of the wastestream;

2) Ci is the concentration of component i as a percent of the waste by weight;

3) Ti is a measure of the toxicity of component i, as provided in subsection (h);

4) A is a constant equal to 300; and

BOARD NOTE: A is a constant used to allow the entry of percent values for Ci, and to adjust the results so that a reference material, 100 percent copper sulfate, with an oral toxicity of 300 mg/kg, achieves an equivalent toxic concentration of 100.

5) Bi is a conversion factor used to convert the toxicity of component i (Ti) to an equivalent oral toxicity. Bi is determined from subsection (i).

b) The toxic amount (M) is calculated as follows:

M = S \* Ceq

where:

1) S is the maximum size of a wastestream shipment in kg/month (Such maximum size shall be specified as a condition of the wastestream classification.); and

2) Ceq is the equivalent concentration from subsection (a).

c) The toxic score is calculated as follows:

1) If the toxic amount (M) is less than 100, the toxic score is 0.

2) If the toxic amount is greater than or equal to 100 and less than 1000, the toxic score is 1.

3) If the toxic amount is greater than or equal to 1000 and less than 10,000, the toxic score is 2.

4) If the toxic amount is greater than or equal to 10,000, the toxic score is 3.

BOARD NOTE: 100 kg/month of the reference material, 100 percent copper sulfate, has a "toxic amount" of 10,000, defining the boderline between a "toxic score" of 2 or 3 for a small quantity generator.

d) The toxic score shall be used as follows:

1) If the toxic score is 0 or 3, the toxic score shall be used for the purposes of Section 808.245 without adjustment.

2) If the toxic score is 1 or 2, the toxic score shall be adjusted based on environmental fate, pursuant to subsections (e), (f) and (g).

e) The environmental fate score (F) is calculated as follows:

F = SUM(Ci \* Li)

where:

1) SUM means the sum of the results of the calculation in parentheses for each component of the wastestream;

2) Ci is the concentration of component i as a percent of the waste by weight; and

3) Li is the environmental level of component i, as determined by subsection (j).

f) adjusted toxic score as follows:

1) If the environmental fate score (F) is less than 100, subtract 1 from the toxic score;

2) If the environmental fate score is greater than or equal to 100 and less than 200, the toxic score is not modified;

3) If the environmental fate score is greater than or equal to 200, add 1 to the toxic score.

g) Use the toxic score or adjusted toxic score calculated pursuant to subsections (b) through (f) for the purposes of Section 808.245.

h) Sources of toxicity data.

1) The generator is required to provide information to substantiate that any waste is other than a type A waste.

2) Carcinogens and mutagens. If available, use a TD50 oral rat to represent toxicity based on carcinogenicity and mutagenicity. Otherwise:

A) Carcinogens are assigned a Ti of 0.1 mg/kg; and

B) Mutagens are assigned a Ti of 0.6 mg/kg.

3) Toxicity values shall be selected according to the following criteria:

A) Toxicities are converted to equivalent oral toxicities as specified in subsection (i);

B) Toxicity values are ranked by source according to the following priorities, with the sources listed in descending order of priority.

i) First oral rat; then inhalation rat; then dermal rabbit; then aquatic toxicity.

ii) If data from the bases is unavailable, then other mammalian toxicity values;

C) If there is more than one toxicity value for the toxicity from the highest priority available source, the lowest (most toxic) equivalent oral toxicity value is used.

i) Conversion factors for equivalent oral toxicities. The following conversion factors must be used to convert toxicity values to equivalent oral toxicities (Bi) (If a carcinogen or mutagen is assigned a value for Ti in the absence of a TD50, Bi is assigned a value of 1.):

|  |  |  |
| --- | --- | --- |
| Toxicity measure | Units | Bi |
|  |  |  |
| Oral – LD50 | mg/kg | 1. |
|  |  |  |
| Carcinogen/mutagen – TD50 | mg/kg | 1. |
|  |  |  |
| Aquatic – 48 or 96 hour LC50 | ppm | 5. |
|  |  |  |
| Inhalation – LC50 | mg/1 | 25. |
|  |  |  |
| Dermal – LD50 | mg/kg | 0.25 |

j) Environmental levels. If the waste constituent is innocuous, the environmental level (Li) is equal to 0. Otherwise, Li for a component is the highest level for that constituent in the following table, based on bioaccumulation, persistence and solubility. (If a value on the boundary between ranges, the higher value of Li is used.):

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bioaccumulation | | | Persistence | | Solubility | | | Li | |
| Min. | Max. | Min. | | Max. | | Min. | Max. | |  |
| 5 | \_ \_ \_ | 365 | | \_ \_ \_ | | 10,000 | \_ \_ \_ | | 3 |
| 4 | 5 | 30 | | 365 | | 1000 | 10,000 | | 2 |
| 0 | 4 | 0 | | 30 | | 0 | 1000 | | 1 |

1) "Innocuous" waste constituents are those for which BiTi, as determined pursuant to subsection (a), is greater than 5000 mg/kg.

2) Bioaccumulation is measured as the logarithm to the base 10 of the n-octanol/water partition coefficient for the waste constituent, as measured pursuant to ASTM E 1147, incorporated by reference in Section 808.111.

3) Persistence is determined pursuant to subsection (k).

4) Solubility is measured as parts per million on a weight basis. Solubility may be measured pursuant to ASTM E 1148, incorporated by reference in Section 808.111.

k) Persistence. If available, a value for persistence, measured, pursuant to subsection (k)(1), must be used. Otherwise, the table of subsection (k)(2) must be used.

1) Persistence must be measured pursuant to ASTM E 896, incorporated by reference in Section 808.111.

2) Persistence may be estimated using the following table. (The longest half-life indicated must be used for constituents which fit into more than one category):

|  |  |
| --- | --- |
| Type of Compound or Material | Half Life  (days) |
| Metal, metal oxide or inorganic oxide | 366 |
| Inorganic salts | 366 |
| Asbestos | 366 |
| Clay | 366 |
| Plastics or polymers | 366 |
| Pesticides | 366 |
| Halogenated hydrocarbons | 366 |
| Polyaromatic hydrocarbons and biphenyls | 366 |
| Phthalate esters | 366 |
| Paper products | 366 |
| Fats, oils and greases | 366 |
| Resins and pigments | 366 |
| Aromatic and alicyclic hydrocarbons | 31 |
| Aliphatic hydrocarbons |  |
| More than 10 carbons | 31 |
| 10 carbons or less | 1 |
| Waste constituents not otherwise listed | 366 |