I INTRODUCTION

This value applies to the water column and is designed to protect humans from the effects of contaminants in sources of drinking water; it is referred to as a Health (Water Source) or H(WS) value.

Regulations (6 NYCRR 702.2) require that the water quality value be based on the procedures in sections 702.3 through 702.7. A previous fact sheet supported a value of 0.01 ug/L for the sum of p,p'-DDT, p,p'-DDD and p,p'-DDE (NYS, 1984). Available information on p,p'-DDD was examined as described in "Scope of Review," below. Potential water quality values are derived below, and the value of 0.3 ug/L selected as described under "Selection of Value."

II PRINCIPAL ORGANIC CONTAMINANT CLASSES AND SPECIFIC MCL (702.3)

A. Discussion

p,p'-DDD does not have a Specific MCL as defined in 700.1. However, it is in principal organic contaminant class iii as defined in 700.1.

The U.S. Environmental Protection Agency has not established a maximum contaminant level goal (MCLG) or MCL for drinking water for p,p'-DDD.

Under the State Sanitary Code (10 NYCRR Part 5, Public Water Supplies), the New York State Department of Health has established a general
maximum contaminant level of 5 ug/L for principal organic contaminants such as p,p'-DDD in drinking water.

B. Derivation of Water Quality Value

Because p,p'-DDD is in a principal organic contaminant class and has no Specific MCL, regulations require that the water quality value not exceed 5 ug/L.

III ONCOGENIC EFFECTS (702.4)

A. Data

U.S. EPA (1994) classifies p,p'-DDD as B2; a probable human carcinogen, on the basis of an increased incidence of lung tumors in male and female mice, liver tumors in male mice and thyroid tumors in male rats. Also, that it is both a metabolite of and structurally similar to the probable human carcinogen DDT. p,p'-DDD is an oncogen as defined in 6 NYCRR 700.1.

As shown in Exhibit 1, U.S. EPA (1994) derives an oral slope factor (cancer potency factor) for p,p'-DDD of 0.24 (mg/kg/day)^{-1}.

B. Derivation of Water Quality Value

The above slope factor was calculated by U.S. EPA using an interspecies scaling of doses based on the 2/3 power of relative body weights. Proposed New York State regulations call for such scaling to be done on the basis of the 3/4 power of relative body weights. An adjustment to U.S. EPA’s slope is needed to account for the different scaling methods.

The adjustment factor for mouse data (body weight of 0.030 kg) is a multiplication factor of 0.52, which results in a slope of 0.125 (mg/kg/day)^{-1}.

From this, a potential ambient water quality value of 0.3 ug/L is calculated as shown below. For a lifetime cancer risk level of 1 x 10^{-6}, a human dose is calculated:

\[
\text{Human dose} = \frac{\text{risk level}}{\text{slope factor}}
\]

\[
= \frac{1 \times 10^{-6} \times 1000 \text{ ug/mg}}{0.125 \text{ (mg/kg/day)}^{-1}} = 8.00 \times 10^{-3} \text{ ug/kg/day}
\]

Assuming a human body weight of 70 kg and a water consumption of 2 L/day, a potential ambient water quality value is calculated:

\[
\text{Ambient Water Quality Value} = \text{human dose} \times 70 \text{ kg} = p,p'-DDD \text{ (Water Source)} [\text{Page 2 of 6}]
\]
2 L/day

\[ = 8.00 \times 10^{-3} \text{ug/kg/day} \times 70 \text{ kg} = \]
\[ 2 \text{ L/day} \]

\[ = 0.280 \text{ug/L, rounded to 0.3 ug/L} \]

C. Discussion

The current fact sheet presents a separate value for p,p'-DDD alone, consistent with U.S. EPA's approach both on IRIS (U.S. EPA, 1994) and in their National Toxics Rule (U.S. EPA, 1992).

U.S. EPA (1988) also derived a human slope of 1.3 (mg/kg/day)^{-1} for the same Tomatis data used in this fact sheet. As little methodological information is provided and the result is not consistent with either the previous fact sheet or EPA's IRIS value, this slope is not used in this fact sheet.

IV NON-ONCOGENIC EFFECTS (702.5)

No information was found for p,p'-DDD that would yield a value more stringent than the value derived for oncogenic effects.

V CHEMICAL CORRELATION (702.7)

A value based on chemical correlation was not derived because it is believed appropriate to derive a value based on existing data for oncogenic effects.

VI SELECTION OF VALUE

The H(WS) value is designed to protect humans from oncogenic and non-oncogenic effects from contaminants in sources of drinking water. To protect for these effects, regulations (6 NYCRR 702.2(b)) require that the value be the most stringent of the values derived using the procedures found in sections 702.3 through 702.7. The oncogenic value of 0.3 ug/L (6 NYCRR 702.4) is the most stringent value derived by these procedures and is the ambient water quality value for p,p'-DDD.
VII REFERENCES


VIII SCOPE OF REVIEW

Several of the widely-recognized sources listed below can provide a comprehensive review and often a quantitative assessment of the toxicity of a substance. These sources were searched for information on p,p'-DDD; where none was found it is so noted.

- RTECS (Registry of Toxic Effects of Chemical Substances). On-line database.
- CCRIS (Chemical Carcinogenesis Research Information System). On-line database.
- ATSDR (Agency for Toxic Substances and Disease Registry) toxicological profile.
- U.S. EPA ambient water quality criteria document (document not found).
- U.S. EPA health advisory (document not found).
- U.S. EPA drinking water criteria document (document not found).
- IARC (International Agency for Research on Cancer) Monographs Supplement 7 (substance not listed).

Sources reviewed by NYS (1984) include:


The sources above were deemed adequate to assess the literature through 1990. Coverage of recent literature was provided by a New York State Library on-line search of the databases listed below.
• NTIS (National Technical Information Service)
• TOXLINE
• BIOSIS

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