**Fact Sheet Date: March 12, 1998**

# NEW YORK STATE
# - HUMAN HEALTH FACT SHEET -

## Ambient Water Quality Value for Protection of Sources of Potable Water

**SUBSTANCE:** Diquat **CAS REGISTRY NUMBER:** 2764-72-9

**AMBIENT WATER QUALITY VALUE:** 20 micrograms/liter (20 ug/L)

**REMARK:** This value applies to the concentration of diquat ion whether free or as an undissociated salt.

**BASIS:** Non-Oncogenic Effects

## INTRODUCTION

The physical, chemical, and toxicological properties of diquat have been reviewed (Clark and Hurst, 1970; US EPA, 1986, 1990, 1992, 1995a). The following ambient water quality values were derived using these and other references and the procedures outlined in 6 NYCRR 702.2 through 702.7.

## SPECIFIC MCL AND PRINCIPAL ORGANIC CONTAMINANT CLASS (702.3)

Diquat does not have a Specific MCL (maximum contaminant level) as defined in 6 NYCRR 700.1 and is not in a principal organic contaminant class as defined in 6 NYCRR 700.1. Therefore, a water quality value cannot be derived under 6 NYCRR 702.3.

## ONCOGENIC EFFECTS (702.4)

Studies performed to test the oncogenicity of diquat in laboratory animals have substantial flaws and are inadequate to evaluate the oncogenic potential of diquat (US EPA, 1990).

## NON-ONCOGENIC EFFECTS (702.5)

Diquat causes cataract formation and body weight loss in laboratory animals (Clark and Hurst, 1970; US EPA, 1986, 1995a). In 1986, the U.S. EPA established an oral reference dose (equivalent to an acceptable daily intake) of 2.2 micrograms per kilogram per day (2.2 ug/kg/day) for the diquat ion (Exhibit 1, taken from US EPA, 1995a), using procedures consistent with those outlined in paragraphs (a) and (b) of 6 NYCRR 702.5. This reference dose was derived by application of a 100-fold uncertainty factor to a no-observed-effect level of 0.22 milligrams per kilogram per day (0.22 mg/kg/day) of diquat ion for lens opacity and cataracts in rats exposed, via food, to diquat dibromide for two years. A value of 20 ug/L diquat ion (rounded from the calculated value of 15 ug/L) was derived by the U.S. EPA (1992) using procedures consistent with those outlined in paragraph (e) of 6 NYCRR 702.5 and allowing 20% of the acceptable daily intake to come from drinking water (6 NYCRR 702.5(c)).

Although the U.S. EPA reference dose applies to the diquat ion (CAS Registry Number of 2764-72-9), the U.S. EPA's IRIS file for diquat incorrectly uses the CAS Registry Number for diquat dibromide (85-00-7). The water quality value derived in this fact sheet applies to the diquat ion and not to diquat dibromide.

## CHEMICAL CORRELATION (702.7)

A value based on chemical correlation was not derived because there were sufficient data to derive a value based on non-oncogenic effects (6 NYCRR 702.5). Moreover, the data on the toxicity of paraquat (a substance similar in structure to diquat) indicate that there is inadequate evidence for the oncogenicity of paraquat and that a non-oncogenic value for diquat derived by chemical correlation to paraquat would be higher than the value based directly on diquat toxicity data (US EPA, 1995b).

## OTHER STANDARDS AND GUIDELINES

Under New York State Department of Health regulations for drinking-water standards (10 NYCRR Part 5), diquat is an unspecified organic contaminant (UOC) and has a MCL of 50 ug/L. Under the Safe Drinking Water Act, the federal maximum contaminant level goal (MCLG) and the MCL for diquat are both 20 ug/L (rounded from the calculated value of 15 ug/L) (US EPA, 1992), assuming a 70-kg adult drinks 2 L/day and allocating 20% of the U.S. EPA reference dose (2.2 ug/kg/day) to drinking water.

## SELECTION OF VALUE

According to 6 NYCRR 702.2(b), the selected ambient water quality value shall be the most stringent of the values derived using the procedures found in 6 NYCRR 702.3 through 702.7. This value is 20 ug/L (based on non-oncogenic effects) and is the value selected as the water quality value for diquat.

## REFERENCES

Clark, D.G. and E.W. Hurst. 1970. The toxicity of diquat. Br. J. Ind. Med. 27:51-55.

6 NYCRR (New York State Codes, Rules and Regulations). Water Quality Regulations, Surface Water and Groundwater Classifications and Standards: Title 6 NYCRR, Chapter X, Parts 700 - 705. Albany, NY: New York State Department of Environmental Conservation.

10 NYCRR (New York State Codes, Rules and Regulations). Public Water Systems: Title 10 NYCRR, Chapter 1, State Sanitary Code, Subpart 5-1. Albany, NY: New York State Department of Health, Bureau of Public Water Supply Protection.

US EPA (U.S. Environmental Protection Agency). 1986. Guidance for the Reregistration of Pesticide Products Containing Diquat Dibromide as the Active Ingredient. Washington, DC: Office of Pesticides and Toxic Substances.

US EPA (U.S. Environmental Protection Agency). 1990. National Primary and Secondary Drinking Water Regulations; Synthetic Organic Chemicals and Inorganic Chemicals; Proposed Rule. Fed. Register. 55:30370-30448.

US EPA (U.S. Environmental Protection Agency). 1992. National Primary Drinking Water Regulations; Synthetic Organic Chemicals and Inorganic Chemicals; Final Rule. Fed. Register. 57:31776-31849.

US EPA (U.S. Environmental Protection Agency). 1995a. Diquat. On-Line as of March 1. Integrated Risk Information System (IRIS). Cincinnati, OH: Office of Research and Development, Environmental Criteria and Assessment Office.

US EPA (U.S. Environmental Protection Agency). 1995b. Paraquat. On-Line as of March 1. Integrated Risk Information System (IRIS). Cincinnati, OH: Office of Research and Development, Environmental Criteria and Assessment Office.

## SEARCH STRATEGY: ON-LINE TOXICOLOGIC DATABASE

Toxline (1981 to March, 1995) was searched linking the CAS Registry Number for diquat with the keyword "toxicity."

Bureau of Toxic Substance Assessment/dal02&kmm12
New York State Department of Health
March, 1995
93201PRO0779