

Ground Water Quality Standard for Metolachlor

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CASRN# 51218-45-2

NJDEP

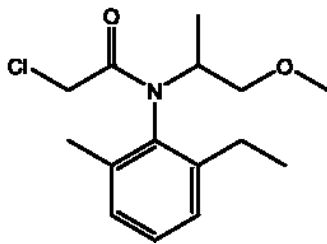
Summary of Decision: In accordance with the New Jersey Ground Water Quality Standards rules at N.J.A.C. 7:9C-1.7, the Department of Environmental Protection (Department) has developed an interim specific ground water quality criterion of 100 µg/L and PQL of 0.5 µg/L (ppb) for Metolachlor. The basis for this criterion and PQL are discussed below. Pursuant to N.J.A.C. 7:9C-1.9(c), **the applicable constituent standard is 100 µg/L.**

Metolachlor

2-Chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl)acetamide

Molecular Formula: C₁₅H₂₂ClNO₂

Molecular Structure:



Background: Metolachlor has been evaluated by USEPA, and a Reference Dose and carcinogenicity classification is available on the USEPA IRIS database. The Department has determined that the USEPA IRIS Reference Dose (RfD) and carcinogenicity classification for Metolachlor are an appropriate basis for the ground water criterion. Metolachlor was classified in IRIS as a possible human carcinogen (Group C) under the previous USEPA risk assessment guidelines (1986). A cancer slope factor for Metolachlor is not provided in IRIS. For chemicals classified as possible human carcinogens (Group C) under the previous (1986) USEPA risk assessment guidelines or as suggestive carcinogens under the current (USEPA, 2005) guidelines, for which no slope factor is available, an additional uncertainty factor of 10 is incorporated into the Reference Dose to protect for possible carcinogenicity.

Reference Dose: The IRIS RfD for Metolachlor is 0.15 mg/kg/day, based on a No Observed Effect Level (NOEL) of 300 ppm (15 mg/kg/day) in two separate rat dietary studies (Ciba Geigy, 1981 and Ciba Geigy, 1983). An uncertainty factor of 100 appropriate for a NOEL from a chronic study was used to derive the IRIS Reference Dose of 0.15 mg/kg/day. This includes an uncertainty factor of 10 for interspecies extrapolation and an uncertainty factor of 10 for intraspecies extrapolation. Therefore, the Reference Dose used as the basis for the interim specific ground water criterion for Metolachlor is 0.015 mg/kg/day.

Derivation of Ground Water Quality Criterion: The ground water quality criterion was derived pursuant to the formula established at N.J.A.C. 7:9C-1.7(c)4, using 0.015 mg/kg/day as the Reference Dose (as explained above), and standard default

assumptions:

$$\frac{0.015 \text{ mg/kg/day} \times 70 \text{ kg} \times 0.2}{2 \text{ L/day}} = 0.1 \text{ mg/L or } 100 \text{ } \mu\text{g/L}$$

Where:

0.015 mg/kg/day = Reference Dose

70 kg = assumed body weight of average person

0.2 = Relative Source Contribution from drinking water

2 L/day = assumed daily drinking water intake

Derivation of PQL: The method detection limit (MDL) and the practical quantitation level (PQL) are performance measures used to estimate the limits of performance of analytic chemistry methods for measuring contaminants. The MDL is defined as "the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero" (40 CFR Part 136 Appendix B). USEPA recommends that the MDL be multiplied by a factor of five or 10 to account for the variability and uncertainty that can occur at the MDL. The Department uses a value of five as the median upper boundary of the inter-laboratory MDL distribution from the New Jersey certified laboratory community and multiplies the MDL by five to derive the PQL. Establishing the PQL at a level that is five times the MDL provides a reliable quantitation level that most laboratories can be expected to meet during day-to-day operations.

Metolachlor appears in the [National Environmental Methods Index \(NEMI\)](#) as a listed parameter in an analytical method – "USEPA 508.1, Chlorinated Pesticides, Herbicides, and Organohalides in Water by GCECD". The limit of detection in the method is 0.015 ppb. As explained above, a more conservative detection limit is established using a multiplier of five. $0.015 \text{ ppb} \times 5 = 0.075 \text{ ppb}$. However, the difference between this result and the theoretical detection limit is not statistically significant. Therefore, the Department has established the PQL as 0.5 ppb.

Conclusion: Based on the information provided above (and cited below), the Department has established an interim specific ground water quality criterion of 100 $\mu\text{g/L}$ and a PQL of 0.5 $\mu\text{g/L}$ (ppb) for Metalochlor. Pursuant to N.J.A.C. 7:9C-1.9(c), since the criterion is higher than the PQL for this constituent, **the applicable constituent standard for Metolachlor is 100 $\mu\text{g/L}$.**

Technical Support Documents: *Interim Specific Ground Water Quality Criterion Recommendation Report for Metolachlor*, Dr. Gloria Post, NJDEP, February 27, 2007; *Procedure for Describing Process for Development of Analytical Practical Quantitation Levels (PQLs) for Metolachlor*, R. Lee Lippincott, Ph.D, NJDEP, May 5, 2006.

References:

Ciba-Geigy Corporation. 1983. MRID No. 00063398, 00084005, 00129377, 00144364, 00158924. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Ciba-Geigy Corporation. 1981. MRID No. 00080897. Available from EPA. Write to FOI, USEPA, Washington, DC 20460.

Sanders, Lippincott and Eaton in "Determining Quantitation Levels for Regulatory Purposes." Journal of the American Water Works Association, March 1996, p. 104-114

[USEPA \(2005\)](#). United States Environmental Protection Agency. Guidelines for Carcinogen Risk Assessment. Risk Assessment Forum, USEPA, Washington, DC. EPA/630.P-03/001F, March 2005.

[USEPA \(2004\)](#). Integrated Risk Information System. Metolachlor (CASRN 51218-45-2). Last modified, 2/9/2004.

USEPA (2003), USEPA Protocol for the Review of Existing National Primary Drinking Water Regulations, 2003 (EPA 815-R-03-002).

USEPA (1986). United States Environmental Protection Agency. The Risk Assessment Guidelines of 1986. Washington, DC. EPA/600/8-87/045. August 1987.



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