



EnviroKleen® Environmental Perspective

Midwest Industrial Supply, Inc. is committed to providing comprehensive and relevant environmental information about our products. Working with various testing laboratories and regulatory organizations enables us to provide unbiased environmental and toxicity data that we use to develop the best dust control and stabilization programs for our customers.

Choosing the right product for an application is more than picking the product with good or sufficient dust control efficiency. It means evaluating the application and understanding all the needs of the customer including environmentally sensitive areas, regulatory constraints, aesthetics, customer preferences, operational or process concerns, and climate. Understanding the environmental and toxicity data and relating it to typical applications and site-specific needs is an important aspect of what Midwest does when working with our customers.

The conclusion of the information presented herein is that all testing shows EnviroKleen®, when applied properly, will not negatively impact soil quality or water quality in terms of toxicity. Generic risk assessment will not replace a conscientious site-specific evaluation, but the data used in this perspective is a necessary component for all risk assessments.

The US EPA Environmental Technology Verification (ETV) Program protocol for Dust Suppression Products evaluated bulk constituents as well as aquatic toxicity on EnviroKleen®. The purpose of the program was to verify the level of dust control (particulate matter, PM, control efficiency) of EnviroKleen® and accumulate environmental data. The US EPA protocol did not allow for commentary on the environmental data.

The US EPA does however have regulatory guidelines that enable us to assess the potential impact of EnviroKleen® on the environment. The test results used for this Environmental Impact Perspective can be found in Appendix A and B of the US EPA ETV report on EnviroKleen® or on the Midwest Website.

1. Tri-State Laboratories, Chemical Analysis, July 2002
2. ABC Laboratories, Various Species Toxicity, September 2002
3. ABC Laboratories, Rainbow Trout Toxicity, September 2003

Chemically, EnviroKleen® is a patent pending synthetic fluid. It is produced by a reaction of specific purified chemical feedstock that is treated via extreme heat, pressure and catalyst during hydrocracking, hydrotreating and hydroisomerization to create a synthetic iso-alkane. Further formulating and blending with purified polyolefins impart the rheological and cohesive properties unique to EnviroKleen®. EnviroKleen® is a non-aqueous liquid that is not water soluble or dilutable.

Application rates vary with soil type and properties and the desired end result of the project. EnviroKleen® is applied topically to the surface of the road with specially designed applicator trucks. Typical application rates range from 0.09 gal/yd² to 0.30 gal/yd². For purposes of this environmental impact analysis the application used in calculations was 0.40 gal/yd², the same total application as that used in the dust control efficiency analysis at Fort Leonard Wood in October 2003.

A full range chemical analysis was performed on EnviroKleen® by Tri-State Labs. Composition analysis included: volatile organic compounds (VOC), semi-volatile organic compounds (SVOC), metals, herbicides/herbicides and polynuclear aromatic hydrocarbons (PAH). Please see TSL, September 2003 for full analysis. The only chemicals detected in EnviroKleen® are four metals.

The US EPA has developed Risk Based Concentrations (RBC) tables for numerous toxic chemicals. These tables list the levels in various media (i.e.: fish, tap water, ground water, ambient air, industrial soil and residential soil) that a chemical can be present in that media and impart little if any risk to humans. The October 2005 Risk Based Concentrations (RBC) Table from EPA Region III was used in this evaluation. The EnviroKleen® application rate used was 0.40 gal/yd², one (1) inch depth penetration was assumed and a soil density of 2.8 g/cm³ was used for calculations. Chemical level in the soil was compared to the RBC levels in residential soil. Analysis shows that at a heavy application of EnviroKleen®, for all detected constituents, the levels are significantly lower than the RBC levels in residential soil. Therefore, EnviroKleen® is safe for use in terms of environmental impact. The results are tabulated in the table below.

Chemical Constituent	EnviroKleen® Level (mg/kg)	Soil Level (mg/kg)	RBC level (mg/kg)
Aluminum	1.000	0.0214	78,000
Iron	25.000	0.5350	23,000
Manganese	0.120	0.0026	1,600
Zinc	0.137	0.0030	23,000

Toxicological evaluation of EnviroKleen® utilized EPA methods for both acute and chronic toxicity determination for aquatic organisms. LC₅₀ values were determined for each of the species. The table below contains a synopsis of the results.

EnviroKleen Aquatic Toxicity Test Results

*Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, EPA/600/4-90/027F.

*Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-91/002.

*Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Marine and Estuarine Organisms, EPA/600/4-91/003.

	Ceriodaphnia dubia	Fathead minnow	Americamysis bahia	Rainbow Trout
ACUTE/SURVIVAL (mg/L)				
LC50	>1000	>1000	>1000	>1000
NOEC	1000	1000	1000	1000
LOEC	>1000	>1000	>1000	>1000
CHRONIC/SURVIVAL (mg/L)				
LC50	>1000	>1000	>1000	>1000
NOEC	1000	1000	1000	1000
LOEC	>1000	>1000	>1000	>1000
CHRONIC/GROWTH/ REPRODUCTION (mg/L)				
LC50	>1000	>1000	>1000	>1000
NOEC	1000	1000	1000	1000
LOEC	>1000	>1000	>1000	>1000

See attached test results:

1. ABC Laboratories, Inc. Americamysis bahia, Fathead minnow, Ceriodaphnia dubia.
2. ABC Laboratories, Inc. Rainbow trout

LC50 -Lethal Concentration, 50%

NOEC - No Observable Effects Concentration

LOEC - Lowest Observable Effects Concentration

The LC₅₀ level is the lethal concentration of the chemical under test that kills 50% of the test organisms in the specified amount of time. According to the EPA-540-9-85-006, suggested toxicity criteria for materials are listed in the table below.

LC ₅₀ (mg/L)	Category Description
<0.1	Very highly toxic
0.1 – 1	Highly toxic
1 – 10	Moderately toxic
10 –100	Slightly toxic
>100	Practically non-toxic

Comparison of the EPA guidelines to the LC₅₀ levels of all species show that EnviroKleen® is practically non-toxic to all species.

In conclusion, all testing shows that EnviroKleen®, when applied properly, will not negatively impact soil quality or water quality in terms of toxicity. Generic risk assessment will not replace a conscientious site-specific evaluation, but the data used in this perspective is a necessary component for all risk assessments.