2,4,5-TP

FACT SHEET ON A DRINKING WATER CHEMICAL CONTAMINANT

GENERAL INFORMATION

Synonyms:
- 2-(2,4,5-Trichlorophenoxy)-Propionic Acid; Silvex; Fenoprop
- Trade Names: Aqua-Vex; Ded-Weed; Kuron; Kurosal; Fruitone 1; Silvi-Rhap; Weed-B-Gon

Chemical Desciption:
- Carboxylic acid herbicide

Properties:
- Commercial formulations of 2,4,5-TP contain small but measureable amounts of 2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD), a highly toxic substance
- White powder at room temperature
- Slightly soluble in water
- Low estimated vapor pressure

Production and Use:
- Prior to 1983, when the EPA cancelled all uses, it was used as an herbicide to control woody plants and weeds in crops, industry (forestry and golf courses), home/garden settings, and in aquatic environments

ENVIRONMENTAL PROFILE

Occurrence:
- Low-level contamination of a few ground water supplies occurred during the 1960's and 1970's, but because of the cancellation of 2,4,5-TP's uses early in the 1980's, present and future occurrence levels of the chemical are considered to be unlikely
- Results of the 1990 National Pesticide Survey (NPS) indicate that 2,4,5-TP was not present in any rural drinking water wells nor in any Community Water System (CWS) wells

Releases:
- Releases to the environment are expected to be negligible, but may occur as residual industrial waste or as persistent residues in soil

Environmental Fate:
- **Released to soil:** not expected to volatilize significantly; soil mobility will vary widely with compound formulation and soil type, but generally expected to have low soil mobility (strong adsorbtion to soil - mobility decreases with decreasing pH) and low potential for migration to ground water; biodegradation and runoff from treated fields may be significant removal processes
- **Released to surface water:** not expected to volatilize from water; expected to strongly bind to sediment where slow biodegradation is expected; photodegradation may occur near the surface of waters
- Low potential for bioaccumulation

HEALTH EFFECTS

Humans:
- Little data on chronic exposure available, but data from case studies of occupational workers in the manufacture of similar chlorophenoxy herbicides indicate that it may have detrimental effects upon the nervous system

Experimental Animals:
- One of the major problems in assessing the effects of 2,4,5-TP is the contamination with varying amounts of 2,3,7,8-TCDD so that it is often unclear whether the reported health effects are attributable to 2,4,5-TP, the dioxin contaminant, or a combination of both:
  - Acute exposure appears to target the liver and kidneys, causing symptoms such as depression, posterior quarter muscle weakness, irritation of the stomach, and minor liver and kidney damage
  - Long-term exposure causes minor liver and kidney damage
  - May have teratogenic potential
  - Inadequate studies to determine mutagenic or carcinogenic potential

REGULATORY PROFILE

Existing Standards:

- **Clean Air Act (CAA):** Not regulated
- **Clean Water Act (CWA):**
  No criteria established
- **Resource Conservation and Recovery Act (RCRA):**
  Hazardous waste
- **Superfund (CERCLA):**
  - Hazardous substance
  - **SARA:** Not regulated
- **Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA):**
  Registered
- **Toxic Substances Control Act (TSCA):**
  Not regulated

HEALTH INFORMATION

Maximum Contaminant Level Goals (MCLG):

- Non-enforceable levels based solely on an evaluation of possible health risks and exposure, and taking into consideration a margin for public safety
- Set at 0.05 mg/L to protect against damage to the liver, kidneys, and nervous system

MCLG for 2,4,5-TP = 0.05 mg/L
(effective July 1992)

Maximum Contaminant Levels (MCL):

- Legally enforceable levels for contaminants in public drinking water supplies
- Based on health risks associated with the contaminants, analytical methods for their assay, and water treatment feasibility and practicality aspects
- Exceedance of the MCL in drinking water may result in adverse effects which will depend upon the contaminant concentration in water, amount of water/contaminant ingested, length of exposure, and other biological parameters
- Current MCL = 0.01 mg/L

MCL for 2,4,5-TP = 0.05 mg/L
(effective July 1992)

EPA Health Advisories (HA):

- **Short-term HAs:** Provide acceptable concentrations of contaminants in water for up to 10 day exposures, primarily to evaluate the public health risk resulting from an accidental spill or an emergency contamination situation
- **Longer-term HAs:** Provide guidance for persistent water contamination situations to cover a period of up to 7 years
- **Lifetime HAs:** Derived in the same way as an MCLG

Health Advisories:

Short-term HA for a child = 0.2 mg/L
Longer-term HA for a child = 0.07 mg/L
Longer-term HA for an adult = 0.3 mg/L
Lifetime HA = 0.05 mg/L

ANALYTICAL METHODS

- Gas Chromatography with an Electron Capture Detector
  EPA Method 515.1

WATER TREATMENT

Permanent Treatment:

- **Best Available Technology (BAT):**
  - Granular Activated Carbon

SHORT-TERM HAZARD ELIMINATION

- If the drinking water standards are exceeded, install BAT or use an alternative drinking water supply such as bottled water

ADDITIONAL HELP

- State or county health officials can indicate a certified laboratory for testing
- Experts in the state Department of Environmental Protection, Natural Resources, or Agriculture may also be of help
- The EPA has toll-free numbers for further information on drinking water quality, treatment technologies, for obtaining Health Advisories, and for other regulatory information
- EPA Hotlines are available Monday through Friday
  - **Safe Drinking Water: 800-426-4791**
  - **National Pesticides: 800-858-7378**
  - **Superfund/RCRA: 800-424-9346**
- For information on the Clean Water Act, call (202) 260-7301
- For information on the Toxic Substances Control Act, call (202) 554-1404
- For information on the Clean Air Act, call (919) 541-2777