### Sources of Exposure

**General Populations**
- The most likely source of 1,2,3-trichloropropane exposure for the general population is contaminated drinking water.
- Exposure can also occur from inhaling 1,2,3-trichloropropane volatilized from household water during showering, bathing, and other household water uses.
- Exposure to contaminated air is also a source of exposure to 1,2,3-trichloropropane especially for populations living near facilities that manufacture or use 1,2,3-trichloropropane or near treatment or disposal facilities.

**Occupational Populations**
- Workers involved in the manufacture or use of 1,2,3-trichloropropane-containing products could be exposed via inhalation or dermal contact. However, manufacturing processes generally occur in closed and tightly sealed systems, which would greatly decrease the risk of exposure.

### Toxicokinetics and Biomonitoring

#### Toxicokinetics
- Approximately 80% of an oral dose is absorbed through the gastrointestinal tract. No absorption data are available for inhalation or dermal routes, although absorption is presumed based on remote toxicity.
- Absorbed 1,2,3-trichloropropane is widely distributed throughout the body.
- 1,2,3-Trichloropropane is rapidly and extensively metabolized. It likely undergoes cytochrome P450-catalyzed dehalogenation reactions.

#### NHANES Biomonitoring
- NHANES biomonitoring data are not available for 1,2,3-trichloropropane in the general population.

### Biomarkers/Environmental Levels

#### Biomarkers
- No biomarkers of exposure to 1,2,3-trichloropropane have been identified in humans. A study in rats suggest that 1,2,3-trichloropropane can be measured in exhaled breath and urine.
- There are no biomarkers of effects that would be specific to 1,2,3-trichloropropane.

#### Environmental Levels

**Air**
- No data are available on levels of 1,2,3-trichloropropane in ambient air.

**Soil and Water**
- 1,2,3-Trichloropropane is not often detected in recently taken soil and water samples. It was detected in <10% of the public water samples collected in California; however, exposure levels were not reported.

### Reference
### 1,2,3-Trichloropropane

**Chemical and Physical Information**

- **1,2,3-Trichloropropane is a Manmade Chemical**
  - 1,2,3-Trichloropropane is a colorless liquid that has a mild and sweet smell.
  - It is likely to evaporate fairly quickly.
  - 1,2,3-Trichloropropane is used as a chemical intermediate in the production of polysulfone liquid polymers and dichloropropene, in the synthesis of hexafluoropropylene, and as a crosslinking agent in the synthesis of polysulfides.
  - In the past, 1,2,3-trichloropropane was used as a solvent and extractive agent. There is no current information to indicate that it is still used for these purposes.

**Routes of Exposure**

- **Inhalation** – Possible route of exposure for general population living near facilities using 1,2,3-trichloropropane.
- **Oral** – Most likely route of exposure for the general population from consuming water that may contain small amounts of 1,2,3-trichloropropane.
- **Dermal** – Not likely a route of exposure for the general population.

**1,2,3-Trichloropropane in the Environment**

- In the atmosphere, 1,2,3-trichloropropane is degraded via reaction with photochemically-produced hydroxyl radicals. It has an estimated half-life of 15.3 days.
- 1,2,3-Trichloropropane in surface water is expected to rapidly volatilize.
- In natural water, it is expected to slowly hydrolyze.
- 1,2,3-Trichloropropane is expected to display high mobility in soil and has the potential to leach into groundwater.
- It is not expected to significantly bioconcentrate in fish and aquatic organisms.

### Relevance to Public Health (Health Effects)

**Health Effects are determined by the dose (how much), the duration (how long), and the route of exposure.**

#### Minimal Risk Levels (MRLs)

**Inhalation**
- An acute-duration (≤14 days) inhalation MRL of 0.001 ppm was derived for 1,2,3-trichloropropane.
- No intermediate- or chronic-duration inhalation MRLs were derived for 1,2,3-trichloropropane.

**Oral**
- No acute-duration oral MRL was derived for 1,2,3-trichloropropane.
- An intermediate-duration (15–364 days) oral MRL of 0.03 mg/kg/day was derived for 1,2,3-trichloropropane.
- A chronic-duration (≥365 days) oral MRL of 0.01 mg/kg/day was derived for 1,2,3-trichloropropane.

**Health Effects**

- Almost all of the available information on the toxicity of 1,2,3-trichloropropane comes from studies in experimental animals.
- Studies in experimental animals have identified several targets of toxicity including the respiratory tract, liver, kidney, hematological system, and cancer.

**Children’s Health**

- Children exposed to 1,2,3-trichloropropane would be expected to experience effects similar to those expected in adults.

**Inhalation** exposure to 1,2,3-trichloropropane has resulted in damage to the nasal olfactory epithelium in rats and mice.

- Nasal, bronchial, and lung damage has also been observed in animals ingesting 1,2,3-trichloropropane.
- Liver effects, including increases in liver weight and bile duct hyperplasia, have been observed in animals following inhalation and oral exposure.
- Kidney effects in animals include increases in kidney weight, necrosis, and increased severity of chronic nephropathy.
- Anemia has been observed following inhalation and oral exposure.
- Neoplastic lesions have been observed in the forestomach, oral mucosa, liver, kidneys, clitoral gland, mammary gland, preputial gland, Harderian gland, and Zymbal’s gland.
- The Department of Health and Human Services (HHS) categorized it as reasonably anticipated to be a human carcinogen. The U.S. Environmental Protection Agency (EPA) concluded that it is likely to be carcinogenic to humans.