

# Contaminated Soils Info Sheet

A condensed guide to contaminated soils in urban areas

Additional Urban Soils Resources found at [Urbansoils.org](http://Urbansoils.org)

## What is Soil Contamination?

Any substance in the soil that exceeds naturally-occurring levels and poses human and/or environmental health risks is a soil contaminant.

Naturally occurring levels of chemicals in the soil are known as **background levels**. In some parts of the world, background levels of certain chemicals in soil, such as arsenic, can pose a health risk – however most contamination of soils is anthropogenic in origin, or the result of human activity.

## Why is Understanding Soil Contamination Important?

Contaminated soils can harm those who work with or around soils, such as gardeners, and children are particularly vulnerable to most types of soil contaminants.

Additionally, soil contaminants can enter the groundwater table, where they can spread and enter the drinking water supply. Because most soil contaminants are 'invisible' unless you specifically test for them, it is critical to be aware of **how** soils gets contaminated, and the forms that contamination can take.

## How Do Soils Get Contaminated?

Contaminated soils typically result from anthropogenic (human-created) activity. While contaminated soils are most commonly found in urban and industrial areas, certain soil contaminants were widespread throughout the 20<sup>th</sup> century, such as lead paint, pesticides and fertilizers, and their effects are present nearly everywhere today. Because soil contaminants are individually toxic to humans and animals, aggregate effects from several types of soil contamination have to be considered in places where there are multiple potential sources.

### Common Contaminant Sources

Numbers below indicate NYS DEC guideline levels for residential soils in parts per million (ppm, or mg/kg). Actual health risks vary by person.

### Where Do These Numbers Come From?

Action levels for both inorganic and organic soil contaminants are based on studies performed by the Occupational Safety & Health Administration (OSHA) for industrial workers exposed to toxins, and are set by state-level authorities.

Source	Inorganic Contaminants	Fate & Transport	Current	Legacy	Organic Contaminant Risk
Fertilizers & Pesticides	As: 16, Cd: 2.5, Cr: 36	Widespread, Local	Current	Legacy	High
Batteries & Other Dumping	Pb: 400, Cu: 270, Zn: 2200, Hg: 0.7, Cr: 36	Local	Current	Legacy	Low
Waste Incineration	Pb: 400, As: 16, Hg: 0.7, Cr: 36, Ni: 130	Widespread	Legacy	Legacy	Moderate
Leaded Gas & Lead Paint	Pb: 400	Widespread, Local	Legacy	Legacy	Low
Smelting	Pb: 400, Cu: 270, Zn: 2200, Cd: 2.5, As: 16, Ni: 130	Local	Current	Legacy	Low
Other Industrial Activity	Pb: 400, Cu: 270, Zn: 2200, Cd: 2.5, As: 16, Hg: 0.7, Cr: 36, Ni: 130	Widespread, Local	Current	Legacy	High
Historical Land Use	Pb: 400, Cu: 270, Zn: 2200, Cd: 2.5, As: 16, Hg: 0.7, Cr: 36, Ni: 130	Local	Current	Legacy	High
Dredging, Fill & Soils Relocation	Pb: 400, Cu: 270, Zn: 2200, Cd: 2.5, As: 16, Hg: 0.7, Cr: 36, Ni: 130	Local	Current	Legacy	Moderate/High

### 1 Inorganic Contaminants

Sometimes referred to as simply 'heavy metals', inorganic contaminants can persist in the environment for centuries and are not very reactive or mobile under normal conditions. They rarely affect plant growth, however long term human exposure can cause chronic health effects. Risks depend on age, contaminant concentration, and existing medical conditions

### 2 Fate & Transport

Anthropogenic activities can transport contaminants across wide areas (such as entire cities), or only in relatively specific locations. If the contaminant source is particularly ubiquitous, such as the use of lead paint or leaded gasoline, it can be both widespread and local

### 3 Emission Status

Some contaminants entered the environment in the past through a particular anthropogenic activity, such as waste incineration, but that practice has been halted in most places. This is known as a **legacy source**. Many contaminant sources were less regulated in the past, such as most forms of industrial activity, but they can still introduce contaminants today, albeit at a much smaller scale

### 4 Organic Contaminant Risk

There are many types of organic contaminants and they are typically characterized by high reactivity within the environment, high mobility & volatility (risks to groundwater and air quality), and are more likely to cause acute health problems (requiring immediate medical attention) upon exposure. Organic contamination is much less widespread than inorganic contamination, but more serious! Organic contamination often requires prompt assistance from the appropriate agencies. Certain anthropogenic sources are more prone to producing organic contamination than others. They are often identified by soils having a gasoline-like or 'chemical' odor

## How Can I Tell If My Soil Is Contaminated?

The easiest way to identify inorganic soil contamination is by using an X-Ray Fluorescence Analyzer (pictured) operated by a soil services provider. USI provides **Free Soils Testing Events** in NYC as a community service. If organic contamination is suspected due to the soil emitting a foul gasoline-like or chemical odor, call 911 immediately.



## Remember: Soils Make Life Possible

Soils are the most powerful biogeochemical filter on Earth! They play an enormous and critical role in our ecosystem – even in urban settings. Although soils can get contaminated, they still act as a buffer for your health, and should be both protected and remediated.

