

Resource Concerns

Petroleum and Heavy Metals

Soil

Water

Excess Water

Insufficient Water

Water Quality Degradation

Nutrients

Pesticides

Pathogens

Salts

Petroleum and Heavy Metals

Sediment

Elevated Water Temperature

Air

Plants

Animals

Energy

Water Quality Degradation - Petroleum and Heavy Metals

Heavy metals, petroleum and other pollutants are transported to receiving water sources in quantities that degrade water quality and limit use for intended purposes.

What is it?

Petroleum is generally thought of in terms of crude oil products but also includes all liquid, gaseous, and solid hydrocarbons. Petroleum contamination in agriculture typically occurs through point source spills and from nonpoint sources, where small amounts of petroleum are collected through runoff from asphalt-covered roads and parking areas, and over a long period of time add up to large-scale effects. A heavy metal can be defined as a chemical element with a specific gravity that is at least five times that of water. Examples of heavy metals include arsenic, cadmium, iron, lead, chromium, copper, zinc, nickel, and mercury. Heavy metal contamination is typically through the use and application of biosludge, contaminated animal manure, and artificial fertilizers.

Why is it important?

Protecting ground and surface water from chemical pollutants is a national initiative. Water is an exceptionally valuable natural asset. The health and livelihood of Americans depends on the availability of a safe drinking water supply. Equally important is the role of water quality on fish and aquatic ecosystems. Indirect benefits of water quality are provided by recreational boating, sport fishing, swimming, relaxation, and natural beauty. In large concentrations, the hydrocarbon molecules that make up crude oil and petroleum products are highly toxic to many organisms, including humans. Petroleum products can have a detrimental effect on oxygen demand and transfer in surface water, and it can restrict the penetration of sunlight to aquatic plants. Heavy metals are also toxic, and they can build up in the soil and plant tissue. Most of the ingestion of heavy metals occurs from consumption of plants.

What can be done about it?

The key to addressing petroleum and heavy metal contamination is prevention. The proper handling and storage of petroleum and chemical products can prevent contamination of the soil and water. Containment systems are very effective in containing spills. Heavy metals build up can be addressed through the proper use and application of biosludge, animal manure and artificial fertilizers. The use of soil testing and managing the rate and application of soil amendments are effective preventive measures.

Petroleum and Heavy Metals at a Glance

| Problems / Indicators - Storage and handling of petroleum; use of biosludge, contaminated animal manure, and artificial fertilizers | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Causes | Solutions |
| <ul style="list-style-type: none"> Inadequate storage and handling Application of biosludge, contaminated animal manure, and artificial fertilizers Unprotected surface and groundwater sources | <ul style="list-style-type: none"> Proper storage and handling Petroleum and chemical containment systems Proper application and use of animal manure biosludge and artificial fertilizer Protection of surface and groundwater sources Conservation buffers and application setbacks |