

Arsenic contamination in groundwater

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What is Arsenic?

- Arsenic is a naturally occurring trace element found in rocks, soils and the water in contact with them. Arsenic has been recognized as a toxic element and is considered a human health hazard.

Sources of Arsenic and exposure:

- **Earth's crust:** Arsenic is a natural component of the earth's crust and is widely distributed throughout the environment in the air, water and land. It is highly toxic in its inorganic form.
- **Volcanic action:** Around one-third of the arsenic in the Earth's atmosphere is of natural origin. Volcanic action is the most important natural source
- **Drinking water and food:** The greatest threat to public health from arsenic originates from contaminated groundwater. Inorganic arsenic is naturally present at high levels in the groundwater. Drinking-water, crops irrigated with contaminated water and food prepared with contaminated water are the sources of exposure.
- **Industrial processes:** Arsenic is used industrially as an alloying agent, as well as in the processing of glass, pigments, textiles, paper, metal adhesives, wood preservatives and ammunition.
- **Tobacco and smoking:** a person who smokes tobacco can also be exposed to the natural inorganic arsenic content of tobacco because tobacco plants can take up arsenic naturally present in the soil

Arsenic contamination in groundwater India

- The occurrence of Arsenic in groundwater was first reported in 1980 in West Bengal in India.
- Apart from West Bengal, Arsenic contamination in groundwater has been found in the states of Assam, Bihar, Chhattisgarh, Haryana, Jharkhand, Karnataka, Punjab and Uttar Pradesh.
- The occurrence of Arsenic in the states of Bihar, West Bengal and Uttar Pradesh is in alluvial formations but in the state of Chhattisgarh, it is in the volcanic rocks exclusively confined to N-S trending Dongargarh-Kotri ancient rift zone.
- **Impact of consuming arsenic-contaminated water and food**
- **Inorganic arsenic** is a confirmed carcinogen and is the most significant chemical contaminant in drinking-water globally. Arsenic can also occur in an organic form.
- **Inorganic arsenic** compounds (such as those found in water) are highly toxic while organic arsenic compounds (such as those found in seafood) are less harmful to health.
- **Acute effects:** The immediate symptoms of acute arsenic poisoning include **vomiting, abdominal pain and diarrhea**.
- **Long-term effects:** The first symptoms of long-term exposure to high levels of inorganic arsenic are usually observed in the skin and include **pigmentation changes, skin lesions and hard patches on the palms and soles of the feet (hyperkeratosis)**. These occur after a minimum exposure of approximately five years and maybe a precursor to skin cancer.

