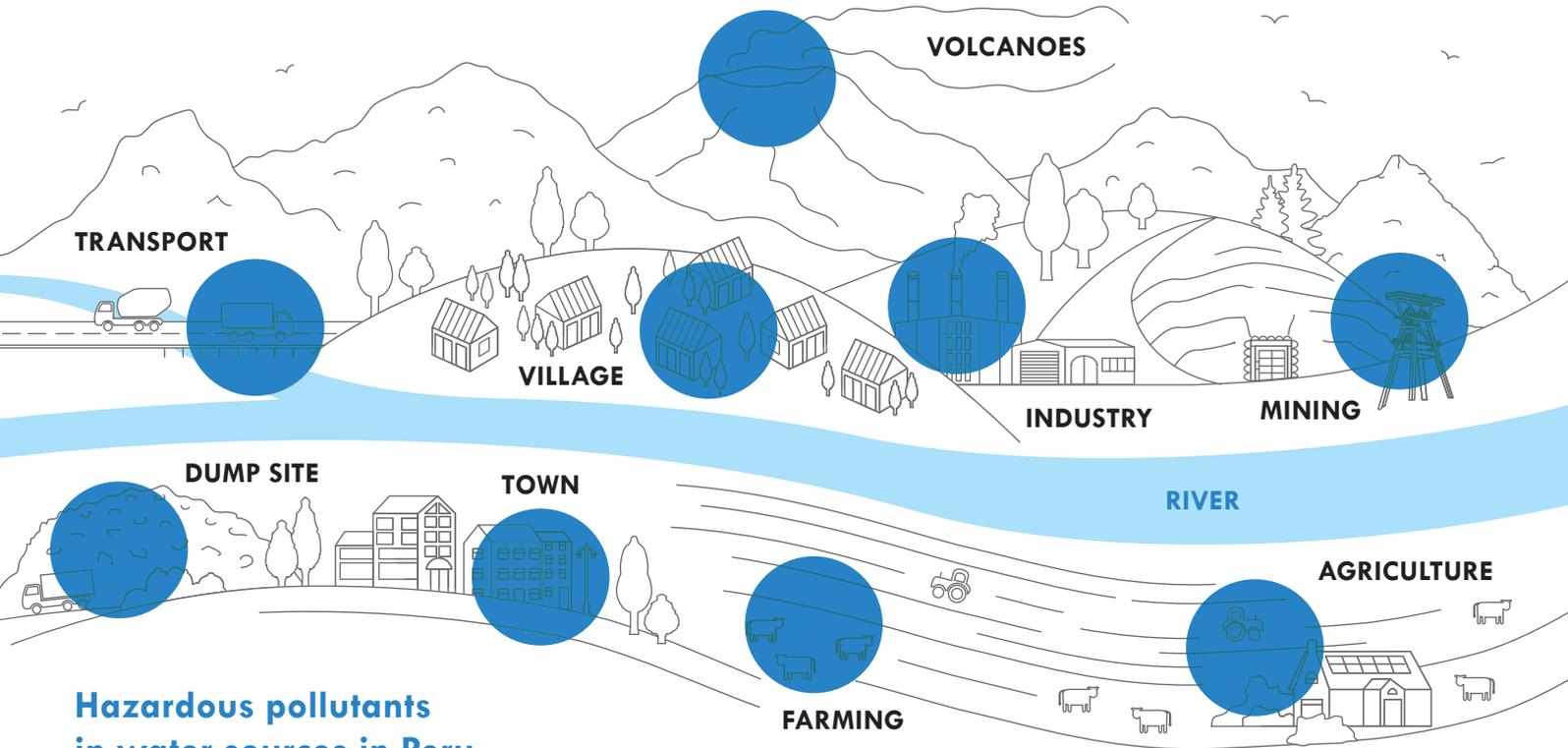


## Drinking water without arsenic, lead, mercury or other pollutants

Peru has various different regions with mountains and rainforests, each of which has different water sources with varying types of pollutants, which have either formed naturally (volcanoes) or by human activities (mining, industry, agriculture, overpopulation, landfills, etc.).



### Hazardous pollutants in water sources in Peru

Peruvian water sources can be contaminated by arsenic, boron, lead, mercury, cyanide, aluminum, other metals and also viruses, bacteria, and others.

These pollutants are extremely harmful to health and long-term exposure may lead to death when not treated carefully.



### Heavy metal pollution in water sources, which may be harmful:



#### Arsenic

Arsenic is carcinogenic, and long-term exposure can lead to chronic arsenic poisoning (arsenicosis). Symptoms include skin lesions with hypo- or hyper-pigmentation, peripheral neuropathy, skin, bladder or lung cancer, diabetes and cardiovascular diseases.

#### Boron

The available results of water analysis show concentrations of boron alarmingly higher (from 4 to almost 12 mg/l) than the limit in the Peruvian Decree (1.5 mg/l). The long-term exposure to boron may lead to anorexia and dermatitis.

#### Lead

Lead is a toxic substance that accumulates in the body affecting various organs. Lead is distributed throughout the body to reach the brain, liver, kidneys and bones and is deposited in teeth and bones, where it accumulates over time. It has harmful effects especially in young children.

#### Mercury

Exposure to mercury (even in small quantities) can cause serious health problems and is dangerous for intrauterine development and in the early stages of life. Mercury can be toxic to the nervous and immune systems, the digestive system, the skin and the lungs, kidneys and eyes.

## Recommended treatment for heavy metals and other contaminants

**High pressure reverse osmosis**, used for large cities, communities, is capable of removing any type of chemical (As, Pb, Hg, Al, Mn, others) and biological contaminants, producing high-quality drinking water. This process separates the contaminants and allows only pure water to pass through the membrane. Available in different capacities (1–20 m<sup>3</sup>/h).

Removal: Turbidity, bacteria, organic, viruses, suspended solids, sulfates, heavy metals.



**Low pressure reverse osmosis**, for households, hotels, offices, communities. These units are capable of treating water from the most harmful contaminants, including arsenic, mercury or lead, metals and different types of salts, producing high quality drinking water. Available in different capacities (8–700 l/h).



8 l/h



50 l/h



100 l/h

## Advanced treatment for resistant pollutants

### Water hardness removal:

Calcium and magnesium (total hardness) are removed by ion exchange. Calcium or magnesium ions are exchanged for sodium ions. Ion exchange resin is a high molecular weight substance with a sufficient porosity.



### Sediments removal:

Pressure filtration through Turbidex is an improved method for the removal of small particles, which can damage or obstruct subsequent technologies, such as membranes. Turbidex is an aluminosilicate with a large porosity and is more effective than sand.



### Arsenic, boron, lead removal:

Katalox Light is a unique sorbent – zeolite coated by MnO<sub>2</sub>. Boron is concentrated and creates complexes that are removed in subsequent steps. This sorbent also helps eliminate heavy metals and arsenic in all its forms (III and V).

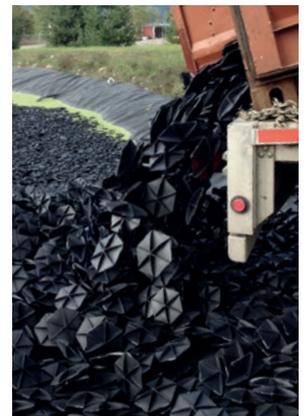


Reverse osmosis is capable of removing the majority of heavy metals and arsenic. Some forms of arsenic and heavy metals are resistant to this technology and may remain in the water. Only 30% of pollutants such as boron are eliminated by this technology.

There are also contaminants that can damage the reverse osmosis membrane. In all these cases, reverse osmosis must be combined with additional treatment steps.

### Protection against algae formation:

Special plastic particles are applied to a waterbody (e.g. a reservoir) and float on the surface of the water. They protect the water against UV light and eliminate organic growth such as algae and weeds.



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