



# OVERVIEW

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A modern office environment with exposed brick walls and industrial lighting. In the foreground, a woman with headphones and a man are looking at a pool table. In the background, other office workers are visible, including a man in a suit and a woman walking, and another person working at a desk with a red cabinet. The word "POLLUTION" is overlaid in a yellow box.

POLLUTION

# POLLUTION

- ◆ **Pollution is the introduction of contaminants into the natural environment that cause adverse change. Pollution can take the form of chemical substances or energy, such as noise, heat, or light.**

# POLLUTANT

- ◆ A substance present in nature in greater than natural abundance due to human activity, which ultimately has a detrimental effect on environment especially on living organisms, called **pollutant**.
- ◆ Eg: Sox, Nox, CO<sub>2</sub>, Heavy metals etc.

# Contaminants

A substance which does not occur in nature but is introduced by human activity into the environment, affecting its composition, is called **contaminant**. A contaminant is considered as a pollutant when it exerts a detrimental effect.

e.g., MIC i.e., methyl isocyanate which is responsible for Bhopal tragedy does not present in nature and so undoubtedly a contaminant. Due to its dangerous effect, it is also a pollutant.

# RECEPTOR

The medium which is affected by pollutant is called receptor.

e.g., Man is the receptor of photochemical smog causing irritation of eyes and respiratory track.



# SINK

**The medium which retains and interacts with long lived pollutant, is called sink.**

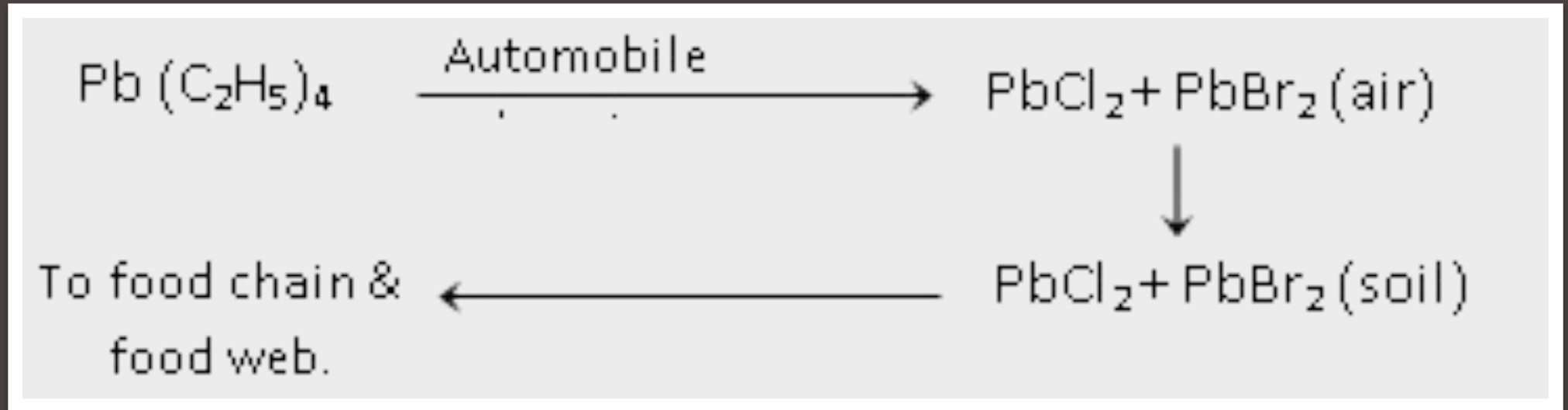
**e.g., A marble wall acts as a sink for atmospheric sulphuric acid (H<sub>2</sub>SO<sub>4</sub>) and ultimately gets damaged.**



**The oceans are also sinks for atmospheric CO<sub>2</sub>**

# PATHWAYS OF A POLLUTANT

The mechanism, by which the pollutant is distributed from its source into environmental segments, is called pathways of that pollutant.



# SPECIATION

- ◆ The method of identification of different forms inorganic, organic and organo-metallic compounds present in environment is called speciation.
- ◆ e.g.,
- ◆ Methyl mercury ( $\text{CH}_3\text{Hg}^+$ ) is more toxic than Hg

# THRESHOLD LIMIT VALUE (TLV)

◆ This indicates the permissible level of a toxic pollutant in atmosphere to which healthy industrial worker is exposed during an eight hour day without any adverse effect.

◆ Example:

TLV for Be and Zn are  $0.002 \text{ mg/m}^3$  and  $1.000 \text{ mg/m}^3$

# POLLUTION STANDARD INDEX (PSI)

- ◆ This index is usually used to assess a particular day's air quality. The PSI converts air pollution concentrations to a simple number between zero and 500 and assigns a descriptive term such as 'good', 'moderate' etc. The descriptive terms corresponding to PSI numbers are given below.



PSI value	Descriptor
0 – 50	Good
51 – 100	Moderate
101 – 199	Unhealthy
200 – 299	Very unhealthy
≥ 300	Hazardous

# CRITERIA POLLUTANTS

- ◆ Scientists have established specific levels of each of six common air pollutants viz. which are dangerous to our health and welfare. These are known as criteria pollutants.
- ◆ In order to protect us, levels of these criteria pollutants are monitored and strictly regulated. Four of the six are directly produced by burning. Burning either fossil fuels (coal, oil or natural gas) or wood causes air pollution which has devastating effects on our lungs and our environment.
- ◆ These are : NO<sub>2</sub>, O<sub>3</sub>, CO, SO<sub>2</sub>, PM, Pb

# AIR POLLUTION

A woman with curly hair, wearing a light-colored button-down shirt, is seated at a desk in a dimly lit office at night. She is looking at a laptop screen and has her hands on the keyboard. The background is dark with some blurred lights from the office environment. The text "AIR POLLUTION" is overlaid in a white, serif font on the right side of the image.

# DEFINITION OF AIR POLLUTION

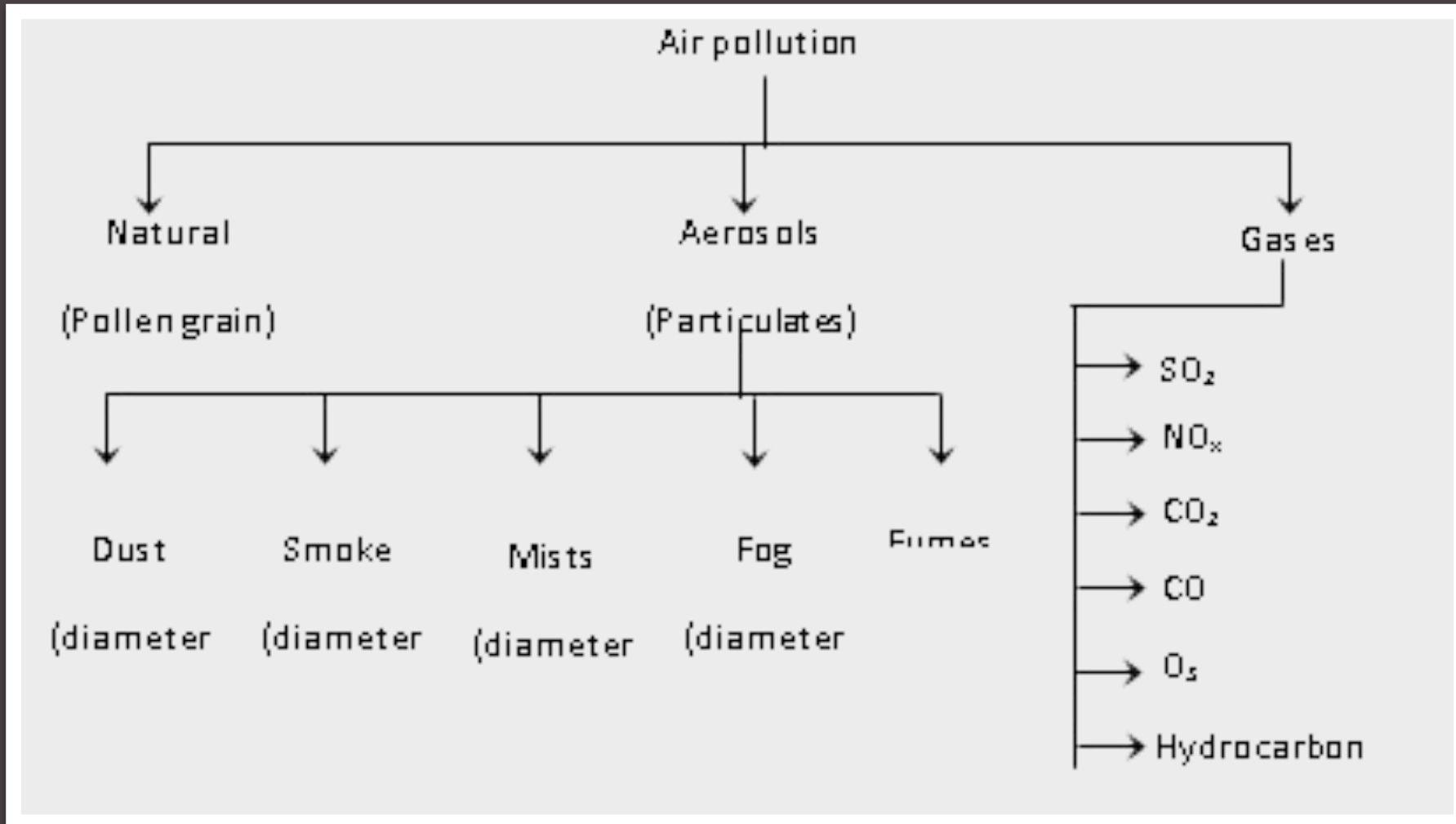
**Air pollution is the presence of substances in the atmosphere that are harmful to the health of humans and other living beings, or cause damage to the climate or to materials. There are different types of air pollutants, such as gases, particulates, and biological molecules.**

# AIR POLLUTANTS

- ♦ The substances, which present in atmosphere in greater than its natural abundance and show some detrimental impacts on the living organism, are considered as air pollutants.



# TYPES OF AIR POLLUTANTS



# ***PRIMARY AIR POLLUTANT***

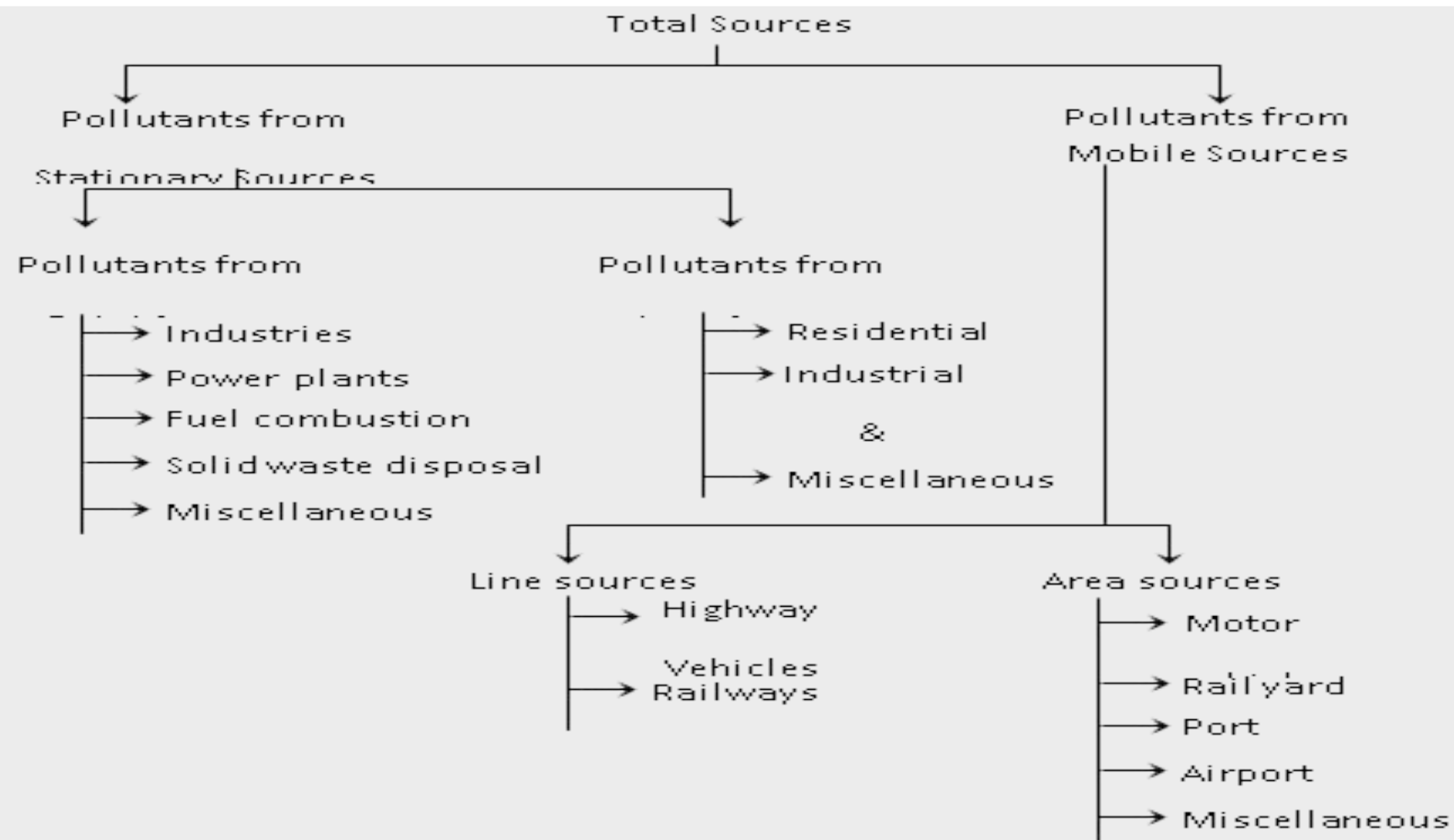
**Primary air pollutants are those emitted directly from the identified sources.**

**e.g., Oxides of Sulphur, Oxides of nitrogen, Carbon mono oxide etc.**

# ***SECONDARY AIR POLLUTANTS***

**Secondary air pollutants are those which are produced in the air by the interaction among two or more primary pollutants or by reaction with normal atmospheric constituents.**

**e.g., Ozone, Formaldehyde, PAN, photochemical smog etc.**





An aerial photograph of the Hoover Dam, a massive concrete structure spanning a deep canyon. The dam is surrounded by rugged, brownish-red rock formations. Behind the dam, the calm, blue waters of Lake Mead are visible. In the foreground, a multi-lane highway bridge crosses the canyon, with several vehicles visible on it. To the left of the dam, there are power transmission towers and lines. The overall scene is a mix of natural beauty and human engineering.

# THANK YOU

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