# Environment & Ecology · GS - III

**The management of hazardous industrial and military waste requires balancing operational safety with environmental protection and public health. Discuss in the context of lead contamination risks.**

| EXAM YEAR | PAPER | SUBJECT |
|---|---|---|
| DAILY PRACTICE 21/11/2026 | GS - III | Environment & Ecology |

| MARKS | WORD LIMIT |
|---|---|
| 15 | ~250 words |

## Answer Hint

**Hazardous waste, lead toxicity, persistent pollutants, environmental clearance, precautionary principle, polluter pays principle, environmental impact assessment, public participation, environmental justice**

## Model Answer

### Introduction

The proposed disposal of nearly 9,500 pounds of unstable lead azide at a US Army ammunition facility in Iowa has raised concerns over airborne lead contamination. The controversy highlights the environmental risks associated with hazardous waste disposal.

### Environmental and Public Health Risks

1. **Toxicity:** Lead exposure can damage the nervous system, kidneys and cardiovascular system, with children particularly vulnerable.
2. **Environmental persistence:** Lead is non-biodegradable and can remain in soil and sediments for long periods.
3. **Air pollution:** Explosive disposal may disperse contaminated particulate matter into surrounding areas.
4. **Food-chain contamination:** Deposited lead can enter agricultural soils, crops and water systems.
5. **Intergenerational effects:** Long-term exposure can cause developmental and cognitive impairments.

### Governance and Regulatory Challenges

- **Safety versus environment:** Disposal methods must minimise both accidental detonation risks and pollution.
- **Regulatory oversight:** Independent monitoring and transparent environmental risk assessments are essential.
- **Community concerns:** Nearby residents require access to information and meaningful participation.
- **Institutional accountability:** Hazardous waste generators must remain responsible for safe handling and disposal.

### Way Forward

India's Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, provide an important regulatory framework. Their implementation should be supported by:

- Risk-based disposal technologies and safer alternatives.
- Continuous air, soil and groundwater monitoring.
- Emergency preparedness and public disclosure of contamination data.
- Strict application of the precautionary and polluter pays principles.

### Conclusion

Hazardous waste disposal must follow a science-based and precautionary approach. Operational safety cannot come at the cost of public health, ecological integrity and environmental justice.

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