**Chapter 14 – Reading Questions**

**AP Outline**

**VI. Pollution (25–30%) Chapters 14-17 will cover these topics.**

**A. Pollution Types**

1. **Water pollution** Chapter 14

*Types; sources, causes, and effects; cultural eutrophication; groundwater pollution; maintaining water quality;*

*Water purification; sewage treatment/septic systems; Clean Water Act and other relevant laws*

2. **Air pollution** Chapter 15

*Sources—primary and secondary; major air pollutants; measurement units; smog; acid deposition—causes and*

*effects; heat islands and temperature inversions; indoor air pollution; remediation and reduction strategies;*

*Clean Air Act and other relevant laws*

**Pollution can come from specific sites or broad areas:**

1. What is the difference between a point source and a nonpoint source of pollution?
2. What are the 5 most common types of pollutants in the water?

**Human Wastewater is a common Pollutant:**

1. What are the 3 main negative effects of contaminating water with human wastewater?

1. How does measuring the biochemical oxygen demand of a lake inform us about the potential presence of wastewater contamination?

1. Put the following statements describing the process of eutrophication in the correct order:

\_\_ Microbes digest the dead organisms, depleting O2 dissolved in the water

\_\_ Nutrients such as N & P are released

\_\_ Fish and other marine organisms die in large numbers

\_\_Large dead zones are created

\_\_ Wastewater enters a natural body of water

\_\_Rapid population blooms of algae & other producers occur, followed by mass die-offs

1. What is a “dead zone” how do nitrogen and phosphorus contribute to dead zone formation?
2. Identify 4 specific diseases or health threats which can come from human wastewater contamination.
3. Explain how a septic tank system works (you may draw a diagram)
4. Explain how a sewage treatment plant works (you may draw a diagram or at least be able to label a diagram)
5. What are manure lagoons, and why do they pose major water-pollution concerns?

**Heavy Metals and other substances can pose serious threats to human health and the environment.**

1. Complete the following chart for heavy metal pollutants found in water:

|  |  |  |
| --- | --- | --- |
| **Metal** | **How does it enter water supply?** | **Risks to human health?** |
| Lead |  |  |
| Arsenic |  |  |
| Mercury |  |  |

1. What are the primary causes of acid deposition in to water?
2. How does a coal scrubber work to reduce acid deposition?
3. What risks does acid deposition pose to ecosystems and/or humans?
4. Complete the following chart regarding synthetic organic compound pollution.

|  |  |  |
| --- | --- | --- |
| **Compound category** | **Source/cause/examples** | **Effects on humans and/or ecosystems** |
| Pesticides & inert ingredients |  |  |
| Pharmaceuticals & hormones |  |  |
| Military compounds |  |  |
| Industrial compounds |  |  |

1. What are the major causes of oil pollution in water bodies?

**Oil Spills can have Catastrophic environmental impacts:**

1. Name two famous oil spills in U.S. history and briefly describe their impacts.
2. Describe the 3 major approaches to remediating oil spills.

**Not all Water pollutants are chemicals:**

1. What are the major components of solid waste pollution in water bodies, and how can it affect ecosystems?
2. What causes sediment pollution, and what negative effects does it have?
3. How can thermal pollution negatively affect an ecosystem?

**A nation’s water quality is a reflection of the nation’s water laws and their enforcement:**

1. What is the objective of the Clean Water Act, and why was it important?
2. The Safe Drinking Water Act established maximum contaminant levels for various substances. Explain what that means and why it is important in protecting water quality.
3. Generally speaking, what is the relationship between a country’s level of economic development and its legislation addressing water pollution? What do you think explains this relationship?

**Chapter 14 Vocabulary List**

|  |  |
| --- | --- |
| Point sources | . |
| Nonpoint sources | . |
| Wastewater | . |
| Oxygen-demanding waste | . |
| BOD  Biochemical oxygen demand | . |
| Dead zones | . |
| Eutrophication | . |
| Cultural Eutrophication | . |
| Algal Bloom | . |
| Pathogen | . |
| Fecal coliform bacteria | . |
| Septic tank | . |
| Leach field | . |
| Sludge | . |
| PCBs | . |
| PBDEs | . |
| Thermal Pollution | . |
| Disinfection (Chlorine/UV) | . |
| Manure lagoon | . |
| Acid mine drainage | . |
| Primary Treatment | . |
| Secondary Treatment | . |
| Tertiary Treatment |  |