**APES Study Guide**

**Unit 8: WATER – SUPPLY, MANAGEMENT & POLLUTION**

 *In this unit we will examine issues relating to water supply, use, management and pollution.*

**Textbook Reference:**

Chapter 13 – Water Resources

Chapter 20 – Water Pollution

**Vocabulary:**

*Directions: Review key vocabulary, words may appear in quizzes and/or tests. You are not required to write the definitions but are encouraged to review them online*

Chapter 13

aquifers

dam

desalination

drainage basin

drought

floodplain

groundwater

reliable surface runoff

reservoir

surface runoff

surface water

water table

watershed

zone of saturation

Chapter 20

cultural eutrophication

eutrophication

nonpoint sources

point sources

primary sewage treatment

secondary sewage treatment

septic tank

water pollution

**Study Guide Questions (SGQ):**

*Directions:**Answer in complete sentences in your composition books. (must be handwritten)*

Chapter 13

1. Discuss the importance of the Colorado River basin in the United States and how human activities are stressing this system.
2. Explain why access to water is a health issue, an economic issue, a women’s and children’s issue, a national and global security issue, and an environmental issue.
3. Describe how water is recycled by the hydrologic cycle and how human activities can overload and altered this cycle.
4. What percentage of the world’s reliable runoff are we using and what percentage are we likely to be using by 2025?
5. Describe the availability and use of freshwater resources in the United States.
6. How many people in the world lack regular access to clean water today and how high might this number grow by 2025?
7. Why do many analysts view the likelihood of greatly increasing water shortages as one of the world’s most serious environmental problems?
8. Describe the connection between water shortages, grain imports, food prices, and malnutrition.
9. What are the advantages and disadvantages of withdrawing groundwater?
10. Describe the problem of groundwater depletion in the world and in the United States, especially over the Ogallala aquifer.
11. Describe the problems of land subsidence and contamination of freshwater aquifers near coastal areas resulting from the overdrawing of water from aquifers.
12. What are the advantages and disadvantages of using large dams and reservoirs?
13. What ecological services do rivers provide?
14. What are the advantages and disadvantages of China’s Three Gorges Dam?
15. Distinguish between distillation and reverse osmosis as methods for desalinating water.
16. What are three major limitations on the widespread use of desalination?
17. What percentage of available freshwater is unnecessarily wasted in the world and in the United States?
18. What are two major causes of water waste?
19. List four ways to reduce water waste in industry and homes, and three ways to use less water to remove wastes.
20. List four ways to use water more sustainably and four ways in which you can reduce your use and waste of water.
21. What is a floodplain and why do people like to live on floodplains?
22. What are the benefits and drawbacks of floods?
23. List three human activities that increase the risk of flooding.
24. List three ways to reduce the risks of flooding.

Chapter 20

1. Distinguish between point sources and nonpoint sources of water pollution, and give an example of each. List nine major types of water pollutants and give an example of each. List three diseases transmitted to humans by polluted water. Describe chemical and biological methods that scientists use to measure water quality.
2. Describe how streams can cleanse themselves and how these cleansing processes can be overwhelmed.
3. Compare the state of stream pollution in more-developed and less-developed countries.
4. Give two reasons why lakes cannot cleanse themselves as readily as streams can.
5. List ways to prevent or reduce cultural eutrophication.
6. Explain why groundwater cannot cleanse itself very well.
7. What are the major sources of groundwater contamination in the United States?
8. Describe the threat from arsenic in groundwater.
9. List ways to prevent or clean up ground-water contamination.
10. Describe three ways to provide safe drinking water in poor countries.
11. Describe U. S. laws for protecting drinking water quality.
12. Describe the environmental problems caused by the wide-spread use of bottled water.
13. How are coastal waters and deeper ocean waters polluted?
14. What causes harmful algal blooms and what are their negative effects?
15. How serious is oil pollution of the oceans, what are its effects, and what can be done to reduce such pollution?
16. List ways to reduce water pollution from (a) non-point sources and (b) point sources.
17. Describe the U. S. experience with reducing point-source water pollution.
18. What is a septic tank and how does it work?
19. Describe how primary sewage treatment and secondary sewage treatment are used to help purify water.
20. What are the options for dealing with sewage sludge?
21. What is a composting toilet system?
22. Describe how we can use wetlands to treat sewage.
23. List six ways to prevent or reduce water pollution.

**Case Studies:**

*Directions: For each of the following reading answer the following:*

1. *What is the author's main idea? Support with two specific examples.*
2. *Summarize the case study in three sentences.*
3. *What ecological lesson can we learn from the case study?*
4. *What is your opinion? Do you agree or disagree?*

Chapter 13

1. The Colorado River Story – page 317
2. Aquifer Depletion in the United States – page 326
3. California Transfers Massive Amounts of Water from Water-Rich Areas to Water-Poor Areas – page 331
4. The Aral Sea Disaster – page 332
5. Living Dangerously on Floodplains in Bangladesh – page 341

Chapter 20

1. Lake Washington – page 528
2. Pollution in the Great Lakes – page 538
3. Is Bottled Water a Good Option – page 543
4. Science Focus: Oxygen Depletion in the Northern Gulf of Mexico – page 546
5. The Exxon Valdez Oil Spill – page 548