

# **NATIONAL GROUNDWATER ASSOCIATION (NGWA) PRACTICE EXAM (SAMPLE) STUDY GUIDE**



## **SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS**

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THE FULL VERSION STUDY GUIDE**

<https://natlgroundwaterassoc.examzify.com>



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# Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

# How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

## 1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

## 2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

## 3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

## 4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

## 5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

## 6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

## Questions

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- 1. What is the difference between confined and unconfined aquifers?**
  - A. Confined aquifers have no water, unconfined aquifers do
  - B. Unconfined aquifers are bounded by impermeable layers, while confined aquifers have a water table open to the atmosphere
  - C. Confined aquifers are bounded by impermeable layers, while unconfined aquifers have a water table that is open to the atmosphere
  - D. Confined aquifers are deeper than unconfined aquifers
- 2. Which factor primarily affects the rate of groundwater recharge?**
  - A. Soil composition and vegetation cover
  - B. Urban development
  - C. Distance from rivers and lakes
  - D. Temperature of the region
- 3. How can pumping tests benefit groundwater resource management?**
  - A. By tracking changes in surface water
  - B. By determining aquifer properties such as transmissivity and storativity
  - C. By identifying the sources of groundwater contamination
  - D. By measuring the chemical content of groundwater
- 4. What is a significant concern with excessive groundwater extraction?**
  - A. It increases surface water levels
  - B. It can lead to land subsidence and reduced water quality
  - C. It promotes higher rainfall
  - D. It supports more vegetation growth
- 5. What are drilling fluids primarily used for in rotary drilling?**
  - A. To provide electrical power to the drill
  - B. To circulate and remove cuttings, cool the bit, and stabilize the hole
  - C. To increase the speed of the drill bit
  - D. To connect different sections of the drill string

**6. What is the difference between groundwater and surface water?**

- A. Groundwater is stored underground, while surface water is found in rivers, lakes, and streams
- B. Groundwater is more polluted than surface water
- C. Surface water is used for drinking, while groundwater is not
- D. Groundwater sources are deeper than surface water sources

**7. What is the primary goal of well development?**

- A. A procedure to facilitate the removal of fine solids and materials from the water-bearing zone of a water well to optimize production
- B. A method for drilling new wells
- C. A technique for improving groundwater quality
- D. A strategy for increasing the depth of existing wells

**8. What is the primary purpose of a well screen?**

- A. To prevent sediment from entering the well
- B. To provide structural support for the borehole
- C. To allow water to pass from the aquifer into the well
- D. To filter pollutants from groundwater

**9. Which factors commonly influence groundwater availability?**

- A. Population density and economic growth
- B. Rainfall, evaporation, and human activity
- C. Soil types and plant species
- D. Weather patterns and climate changes

**10. What is contained within a rotary drill string?**

- A. Drill bit and casing
- B. Drill bit, drill collar, and drill pipe
- C. Drill collar and compressor
- D. Drilling mud and surfactants

## **Answers**

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1. C
2. A
3. B
4. B
5. B
6. A
7. A
8. B
9. B
10. B

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## **Explanations**

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## 1. What is the difference between confined and unconfined aquifers?

- A. Confined aquifers have no water, unconfined aquifers do
- B. Unconfined aquifers are bounded by impermeable layers, while confined aquifers have a water table open to the atmosphere
- C. Confined aquifers are bounded by impermeable layers, while unconfined aquifers have a water table that is open to the atmosphere**
- D. Confined aquifers are deeper than unconfined aquifers

*Confined aquifers are characterized by being surrounded by impermeable or semi-permeable layers of rock or sediment that prevent water from easily flowing in or out. This means that the water in a confined aquifer is under pressure, often resulting in the water rising above the level of the aquifer when tapped by a well, sometimes even flowing freely without the need for pumping. In contrast, unconfined aquifers are directly recharged by surface water and are not bounded by impermeable layers above them. The top of an unconfined aquifer is known as the water table, which fluctuates based on the amount of recharge from precipitation and other sources. It is termed "open to the atmosphere" because it can freely interact with atmospheric pressure and does not have a confining layer above it. This distinction in the configuration of confined and unconfined aquifers is critical for understanding groundwater movement, availability, and management. The difference also impacts aquifer characteristics such as porosity, permeability, and how they respond to extraction and recharge.*

## 2. Which factor primarily affects the rate of groundwater recharge?

- A. Soil composition and vegetation cover**
- B. Urban development
- C. Distance from rivers and lakes
- D. Temperature of the region

*The primary factor affecting the rate of groundwater recharge is indeed soil composition and vegetation cover. Soil composition determines how easily water can infiltrate into the ground; for example, sandy soils allow for faster percolation compared to clay-rich soils, which can impede water movement due to their smaller pore sizes. Additionally, vegetation cover plays an essential role in recharge by intercepting precipitation and facilitating the absorption of water into the soil through root systems. Healthy vegetation can enhance infiltration by breaking up the soil structure, promoting pore space, and creating a better environment for water to traverse. While urban development can dramatically affect groundwater recharge by increasing impervious surfaces, reducing natural infiltration, and altering drainage patterns, it is not the primary or inherent factor in the natural process of recharge. The proximity to rivers and lakes does have an impact on groundwater levels and can influence recharge; however, it is not the primary factor compared to the fundamental characteristics of the soil and vegetation itself. Temperature, while relevant to evaporation rates and ecosystem health, does not directly influence the physical process of water infiltration in the same way that soil type and vegetation do. Thus, the interplay between soil properties and plant cover is crucial in determining how quickly groundwater can be replenished.*

### 3. How can pumping tests benefit groundwater resource management?

- A. By tracking changes in surface water
- B. By determining aquifer properties such as transmissivity and storativity**
- C. By identifying the sources of groundwater contamination
- D. By measuring the chemical content of groundwater

*Pumping tests are essential tools in groundwater resource management, primarily because they provide critical information about aquifer properties, including transmissivity and storativity. Transmissivity refers to the ability of the aquifer to transmit water through its saturated thickness, while storativity indicates the amount of water that can be stored in the aquifer per unit surface area. By conducting a pumping test, data is collected on how the water level in the well changes over time as water is withdrawn. This data allows hydrogeologists to calculate the aquifer's response, which is used to quantify these properties. Understanding transmissivity and storativity is vital for effective groundwater management, as it helps determine sustainable pumping rates, predict the impact of withdrawals on water levels, and assess how quickly aquifers can recharge. While it is true that other choices may relate to groundwater issues, they do not directly address the primary benefits of using pumping tests for measuring aquifer characteristics. Tracking changes in surface water and identifying contamination sources involve different aspects of hydrology and environmental science, while measuring the chemical content of groundwater pertains to water quality rather than hydrodynamic properties. Thus, the clarity and focus on aquifer properties provided by pumping tests make the understanding of transmissivity and storativity the correct benefit*

### 4. What is a significant concern with excessive groundwater extraction?

- A. It increases surface water levels
- B. It can lead to land subsidence and reduced water quality**
- C. It promotes higher rainfall
- D. It supports more vegetation growth

*Excessive groundwater extraction poses a significant concern because it can lead to land subsidence and reduced water quality. When groundwater is removed at a rate faster than it can naturally be replenished, the pressure that supports the soil and rock layers above it decreases. This loss of pressure can result in the ground sinking or collapsing, known as land subsidence, which can damage infrastructure, alter drainage patterns, and impact ecosystems. Additionally, as the water table drops due to over-extraction, it can cause the concentration of contaminants in remaining water supplies to increase, leading to deteriorated water quality. This situation can also allow for the infiltration of saltwater in coastal areas, which poses a serious threat to freshwater supplies. As such, addressing groundwater extraction is crucial to maintaining the integrity of both the land and the water supply.*

## 5. What are drilling fluids primarily used for in rotary drilling?

- A. To provide electrical power to the drill
- B. To circulate and remove cuttings, cool the bit, and stabilize the hole**
- C. To increase the speed of the drill bit
- D. To connect different sections of the drill string

*Drilling fluids, also known as mud, play a crucial role in the process of rotary drilling. Their primary function is to circulate down the borehole, which achieves several important tasks. One of the primary functions is to remove cuttings created as the drill bit penetrates the earth. This circulation helps to bring these solid particles back to the surface, ensuring that the borehole remains clear and reducing the chances of the drill bit becoming stuck or slowed down by debris. Additionally, drilling fluids contribute to cooling the drill bit. As drilling generates heat due to friction, the fluid helps to dissipate this heat, allowing for more efficient drilling operations and prolonging the life of the drilling equipment. Stabilization of the borehole is another essential function of drilling fluids. By maintaining pressure within the wellbore and providing support to the walls, drilling fluids help to prevent collapses or the unwanted influx of water or other fluids, making it safer and more efficient to drill. While other options touch on specific components of the drilling process, they do not encompass the multifaceted role that drilling fluids play within rotary drilling. Thus, the answer highlighting the circulation, removal of cuttings, cooling of the bit, and stabilization of the hole accurately reflects the primary use*

## 6. What is the difference between groundwater and surface water?

- A. Groundwater is stored underground, while surface water is found in rivers, lakes, and streams**
- B. Groundwater is more polluted than surface water
- C. Surface water is used for drinking, while groundwater is not
- D. Groundwater sources are deeper than surface water sources

*The distinction outlined in the first choice highlights a fundamental difference between groundwater and surface water. Groundwater refers to water that is found in the saturated zone below the earth's surface, filling the spaces between soil particles and fractures in rocks. This water often accumulates over long periods and can be accessed through wells. On the other hand, surface water is located in bodies of water such as rivers, lakes, ponds, and streams that are above ground. Understanding this difference is crucial as it illustrates how these two forms of water exist in different environments and ecosystems. While it is true that groundwater can be more susceptible to contamination under certain conditions, this does not constitute a defining characteristic when differentiating the two types of water. Additionally, groundwater is often an important source of drinking water, complementing surface water supplies in many communities, thus refuting the notion that surface water is exclusively used for drinking. Finally, the depth at which groundwater is located can vary significantly, and while it is often deeper than surface water sources, this is not an absolute rule as there can be exceptions based on local geography and hydrology. Therefore, the primary distinction lay in their locations – underground versus above ground, which is captured accurately in the first choice.*

## 7. What is the primary goal of well development?

- A. A procedure to facilitate the removal of fine solids and materials from the water-bearing zone of a water well to optimize production
- B. A method for drilling new wells
- C. A technique for improving groundwater quality
- D. A strategy for increasing the depth of existing wells

*The primary goal of well development focuses on optimizing the production of groundwater from a well. This involves actions taken to remove fine particles and materials from the water-bearing zone, which can be caused by the drilling process. When a well is drilled, it often disturbs the surrounding materials, leading to the accumulation of barrier formations that can inhibit water flow into the well. By facilitating the removal of these fine solids, well development enhances the hydraulic conductivity of the aquifer around the well, enabling a better flow of water into the well and increasing the overall yield. This process may involve techniques such as air lifting, surging, or flushing, aimed at achieving a stable and productive well that effectively taps into the groundwater resource. The other options, while related to water wells, do not capture the essence of the primary goal of well development, which is fundamentally about improving production efficiency by enhancing water flow into the well.*

## 8. What is the primary purpose of a well screen?

- A. To prevent sediment from entering the well
- B. To provide structural support for the borehole
- C. To allow water to pass from the aquifer into the well
- D. To filter pollutants from groundwater

*The primary purpose of a well screen is to allow water to pass from the aquifer into the well. This component is crucial because it provides an interface between the aquifer and the well itself, facilitating the flow of groundwater into the well for extraction while keeping the surrounding geological materials in place. Well screens are typically made of perforated materials that allow water to enter from the surrounding formation, while the design minimizes the entry of sediment and larger particles which could clog the well. Therefore, while a well screen contributes to preventing sediment from entering the well, its fundamental role is to ensure efficient water flow from the aquifer. In considering the other potential functions mentioned, while providing structural support for the borehole and filtering pollutants can be important in well design and maintenance, these are secondary to the core function of enabling the supply of water from the aquifer to the well. Thus, the essential role of the well screen remains its ability to facilitate water movement, which is why it is fundamental to groundwater extraction systems.*

## 9. Which factors commonly influence groundwater availability?

- A. Population density and economic growth
- B. Rainfall, evaporation, and human activity**
- C. Soil types and plant species
- D. Weather patterns and climate changes

The correct choice highlights the direct environmental factors that significantly influence groundwater availability. Rainfall is a critical component because it contributes to the recharge of aquifers, replenishing the groundwater supply. Areas with consistent and adequate rainfall typically have higher groundwater levels, while regions with low precipitation may experience depletion. Evaporation also plays a crucial role, particularly in warmer climates where higher temperatures can lead to increased evaporation rates, effectively decreasing the amount of water that reaches the ground and can contribute to groundwater. This can significantly impact the overall availability of groundwater resources. Human activity further complicates groundwater availability. Actions such as land development, agriculture, and industrial processes can lead to increased consumption of groundwater and changes to the natural recharge patterns. For instance, the construction of impervious surfaces can prevent rainwater from infiltrating into the ground, reducing the opportunity for aquifers to replenish. While the other options mention important factors, they do not capture the direct influences on groundwater availability as effectively as the chosen answer. Population density and economic growth, for example, can affect groundwater through increased demand but are not direct environmental factors. Soil types and plant species may influence water retention and usage but are secondary factors in the overall context of groundwater availability. Weather patterns and climate changes are relevant, but they

## 10. What is contained within a rotary drill string?

- A. Drill bit and casing
- B. Drill bit, drill collar, and drill pipe**
- C. Drill collar and compressor
- D. Drilling mud and surfactants

A rotary drill string is a critical component in the drilling process, primarily used for penetration into the earth to reach groundwater or other resources. The correct answer identifies that the rotary drill string includes a drill bit, drill collar, and drill pipe. The drill bit is the cutting component that facilitates the actual penetration into the material beneath the surface. It is attached to the end of the drill string and is responsible for breaking up the rock or sediment to create a borehole. Drill collars are heavy, thick-walled pipes that are part of the drill string. Their primary function is to add weight to the drill bit, which enhances its ability to penetrate deeper and through harder geological formations. These collars also help to stabilize the drill bit during the drilling process, reducing vibrations and improving the overall efficiency of drilling. Drill pipes are the segments of the drill string that connect the surface equipment to the drill bit. They provide the necessary length to reach the desired depth and enable the transfer of rotary motion from the surface down to the drill bit. This integrated assembly—comprising the drill bit, drill collar, and drill pipe—works together to create a continuous operation for drilling, making this answer the most accurate choice regarding what is contained within a rotary drill string.

## Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at [hello@examzify.com](mailto:hello@examzify.com).

Or visit your dedicated course page for more study tools and resources:

<https://natlgroundwaterassoc.examzify.com>

We wish you the very best on your exam journey. You've got this!

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