GROUNDWATER AT WIPP

2006 EPA WIPP FACT SHEET No. 5

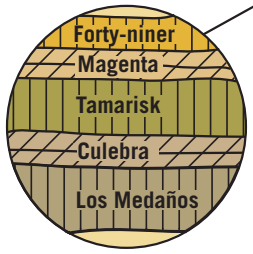
What is Groundwater?

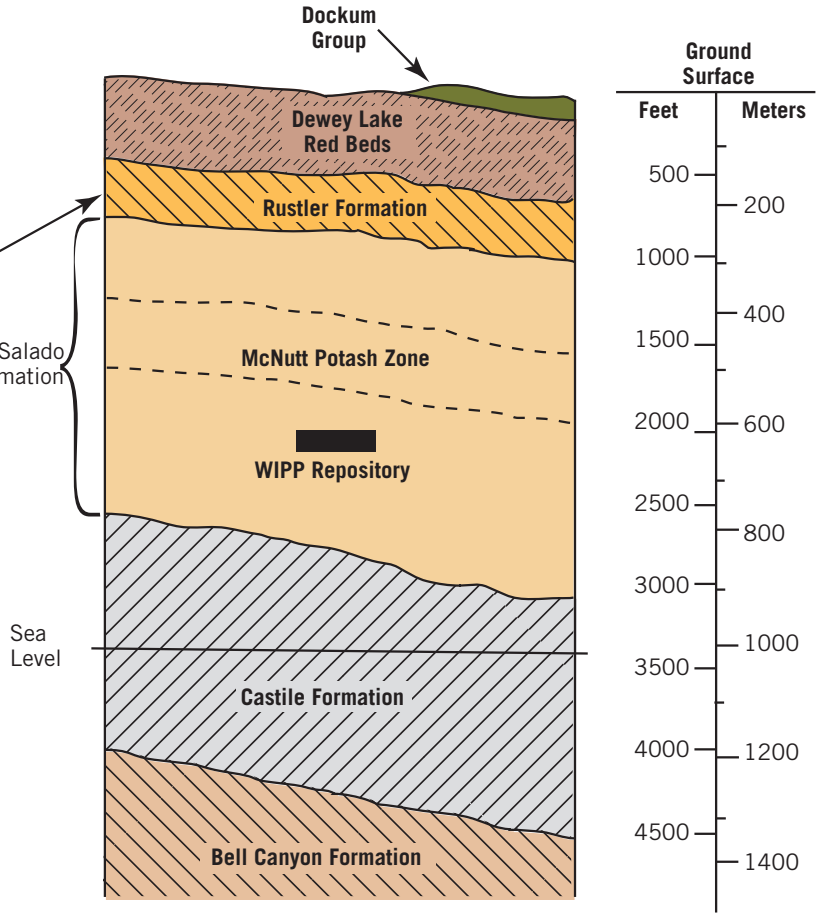
Groundwater is water that exists under the Earth's surface. Depending on the types of rock present, groundwater can be stored in different quantities, and move at different speeds. In general, groundwater travels through dense rock exceptionally slowly, as slow as a few feet over hundreds and even thousands of years. Groundwater moves more quickly through porous rocks where cracks, or fractures, exist. Such rocks are said to be permeable to groundwater.

How Does Groundwater Affect the WIPP?

For over 25 years, DOE scientists have studied groundwater flow and conditions at the WIPP site to determine potential pathways for radioactive releases. DOE's certification application identified two geologic units that are potential groundwater pathways for radioactive releases to the environment:

1. The Culebra Dolomite unit in the Rustler Formation
2. The Salado Anhydrite units within the salt bed and close to the waste.





Cross-section showing major geologic units above and below the WIPP repository.

Although none of the geologic units above the repository are highly permeable, the most permeable unit is the Culebra Dolomite. Because the Culebra is located over 1,000 feet above the WIPP repository, radioactive releases into this rock unit would only be possible if a borehole was drilled through the repository.

The Salado Formation contains thick layers of salt, thin layers of anhydrites, and some clay. The Salado Anhydrite units are located above and below the zone where waste is being placed. (You may see them referred to as marker beds 138 and 139.) Even though the Salado has very low permeability to groundwater, it is still modeled (via the marker beds) as a potential pathway for radioactive releases.

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Both groundwater units were included in DOE's calculations for the certification performance assessment. Both units were found to have only very minor contributions to releases from the WIPP repository. This is due to the large amount of time it would take radionuclides to travel through them, and the limited amount of radionuclides expected to reach them.

Monitoring of Groundwater at WIPP

- As part of the overall monitoring plan for WIPP, DOE maintains an extensive groundwater monitoring program.
- EPA conducts annual inspections of the DOE's groundwater monitoring program and receives and analyzes periodic reports on groundwater data from DOE.
- Since 1998, DOE has reported overall increases in water levels in the wells that monitor the Culebra Dolomite unit.
- DOE is drilling new wells to enhance monitoring of the Culebra Dolomite unit.
- EPA has identified the need for DOE to increase understanding of the hydrologic characteristics of the geologic units above the repository, such as the Magenta.

EPA's Technical Evaluation of Groundwater in the 2004 Recertification Application

The 2004 recertification application appropriately documented changes in the water levels of the Culebra Dolomite wells. The changes were incorporated into the groundwater modeling of the performance assessment. These changes resulted in longer times for projected radionuclide releases than were last estimated in the certification application. EPA determined that DOE adequately incorporated groundwater changes into the recertification application, including the performance assessment.

For more information on EPA's evaluation of groundwater for recertification, go to EPA's website or docket to the Compliance Application Review Documents for Section 15.

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