

## Innovative Erschließungsmethoden in der Tiefen-Geothermie

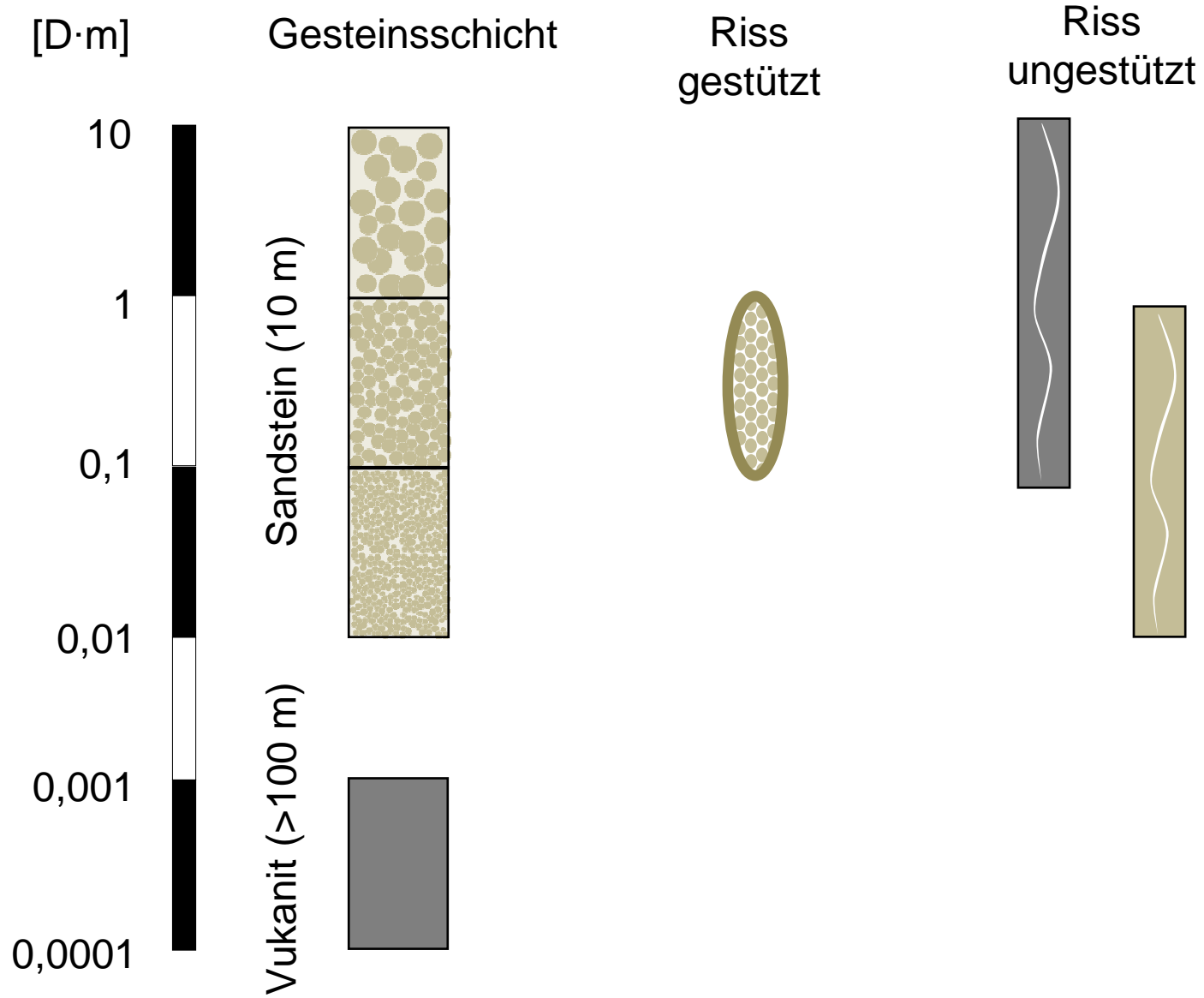
Reinhard Jung

# Transmissibilität Temperatur

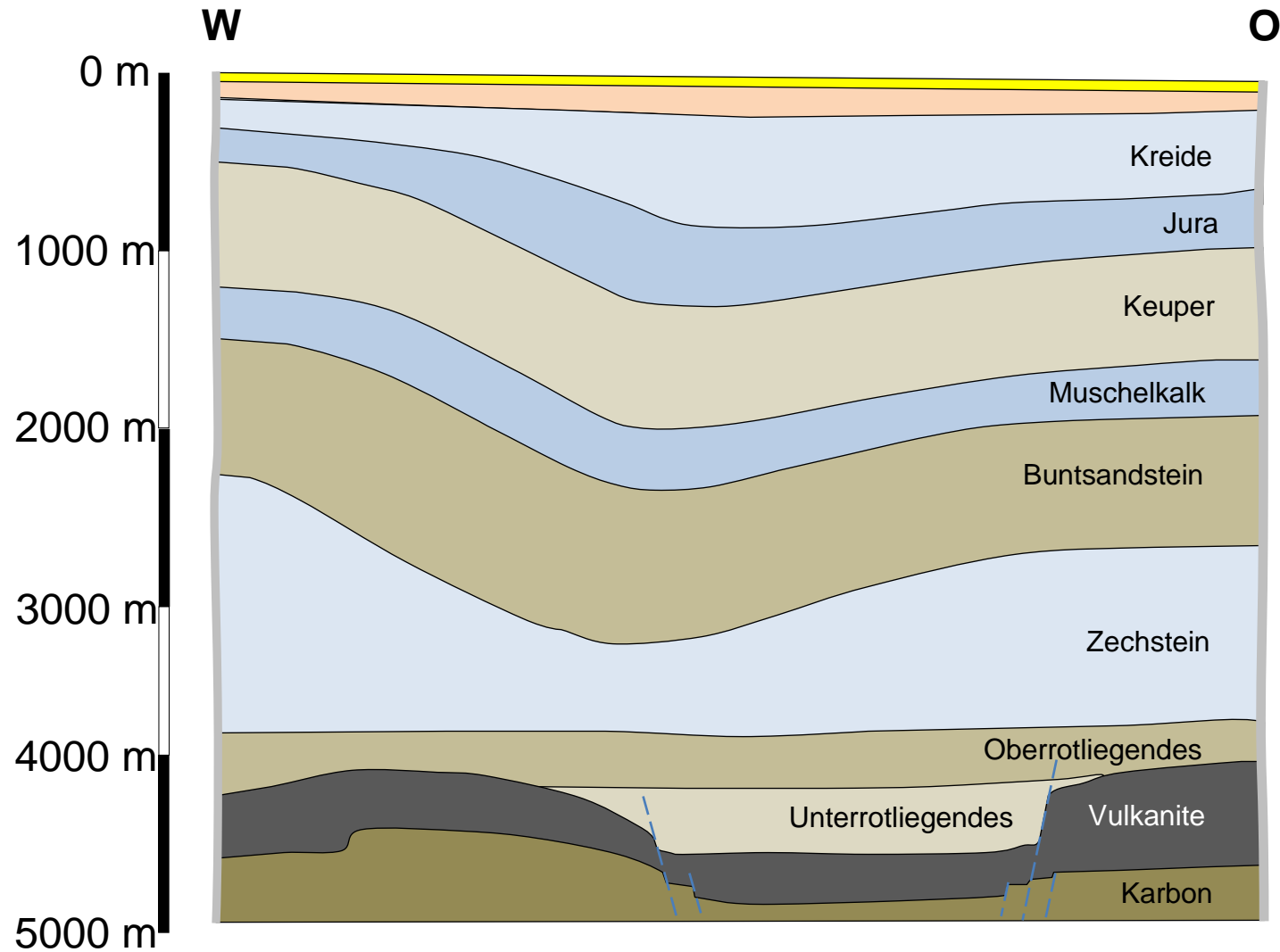


Quelle: GGA-Hannover

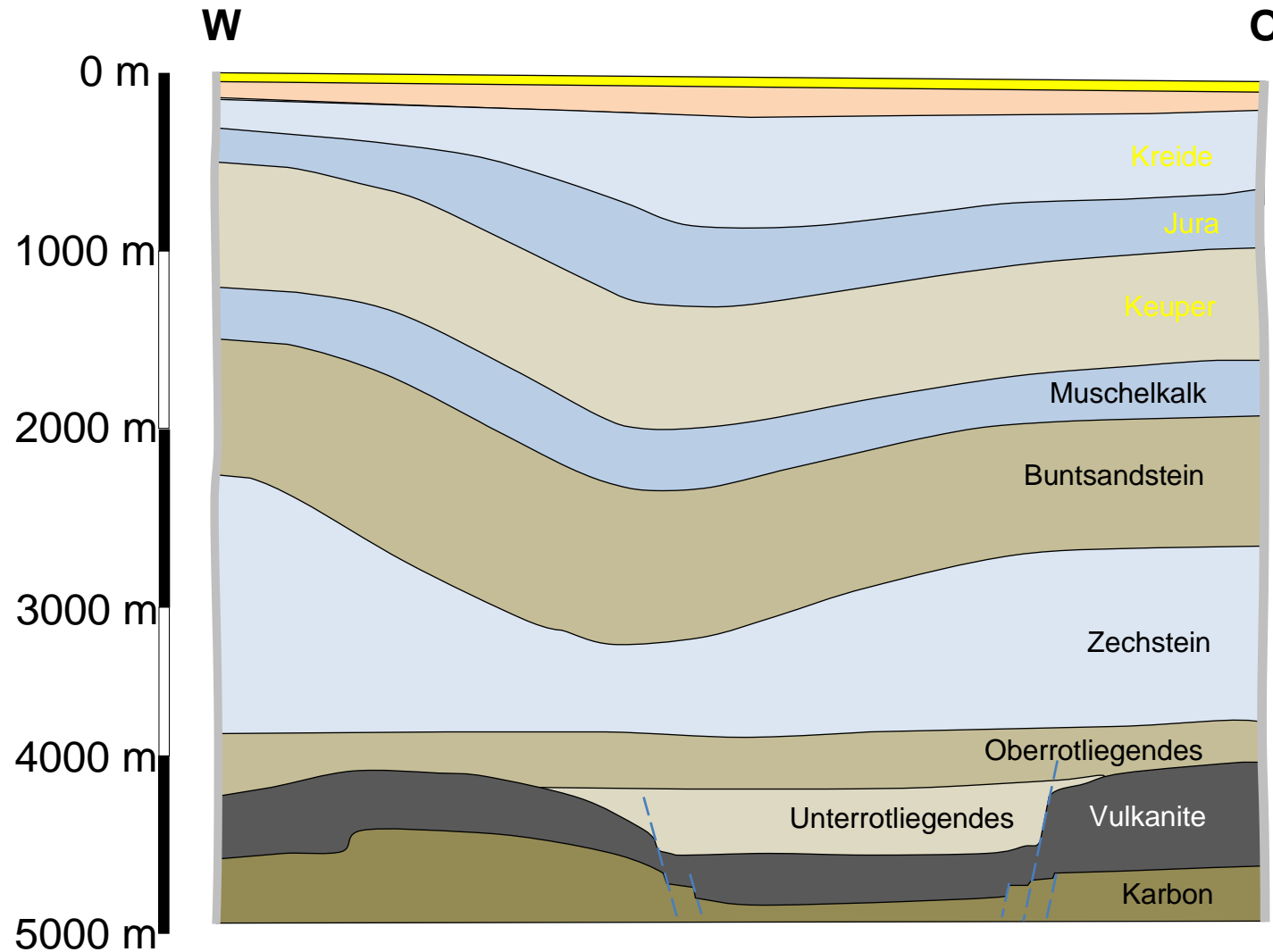
# Transmissibilität



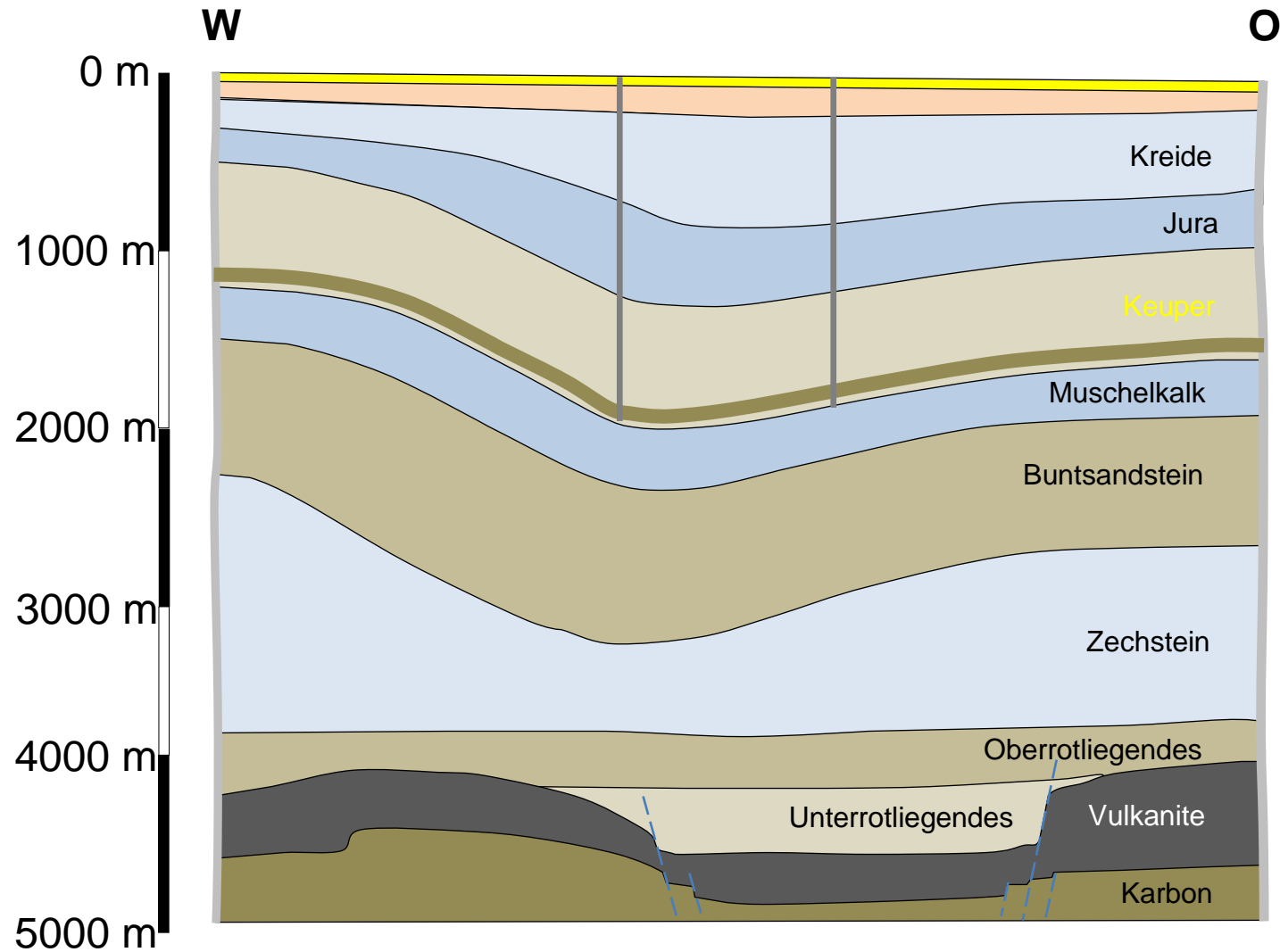
# Hohe Transmissibilität ( $T \cong 10 \text{ D}\cdot\text{m}$ )



# Hohe Transmissibilität ( $T \cong 10 \text{ D}\cdot\text{m}$ )

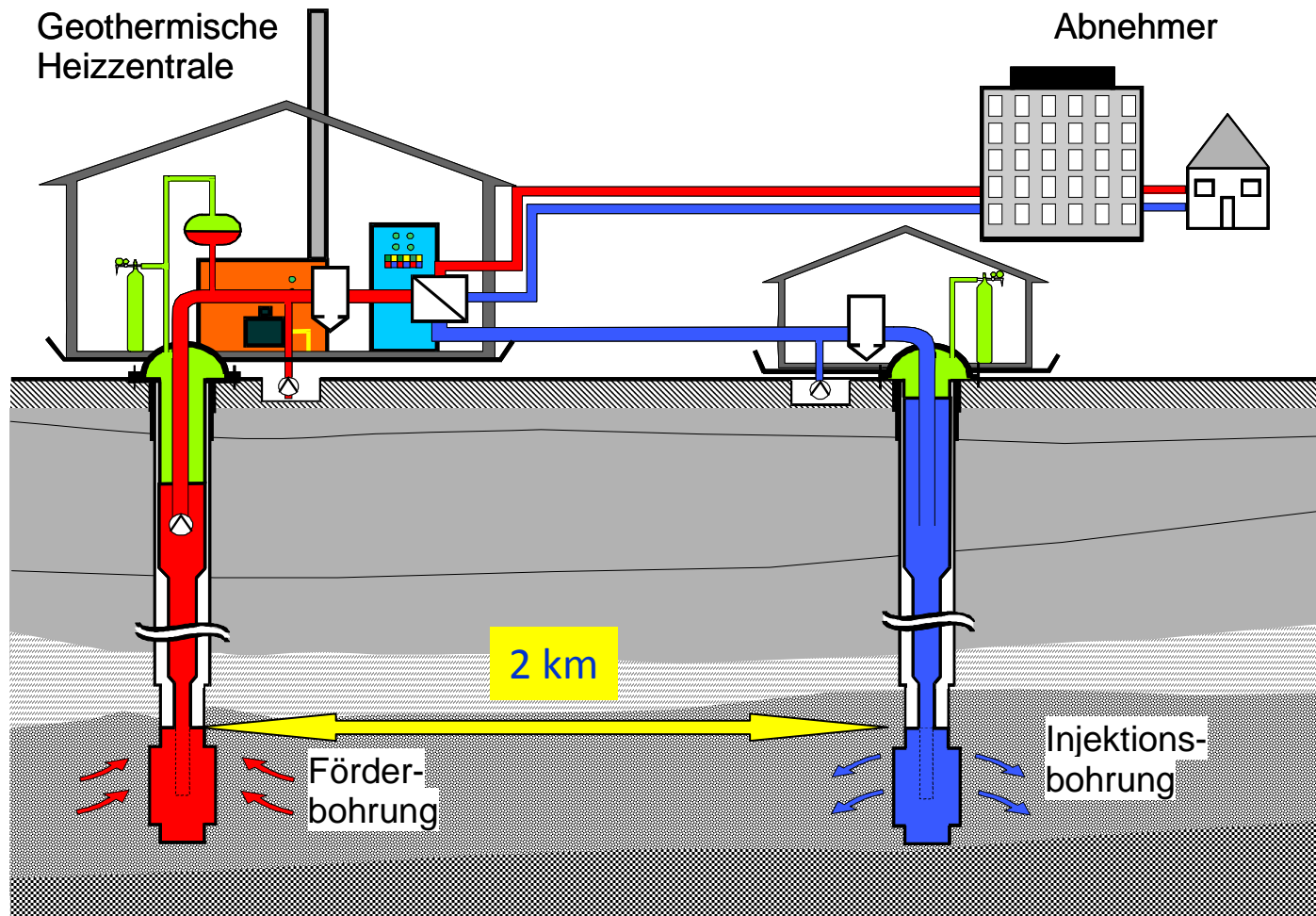


# Hohe Transmissibilität ( $T \cong 10 \text{ D}\cdot\text{m}$ )



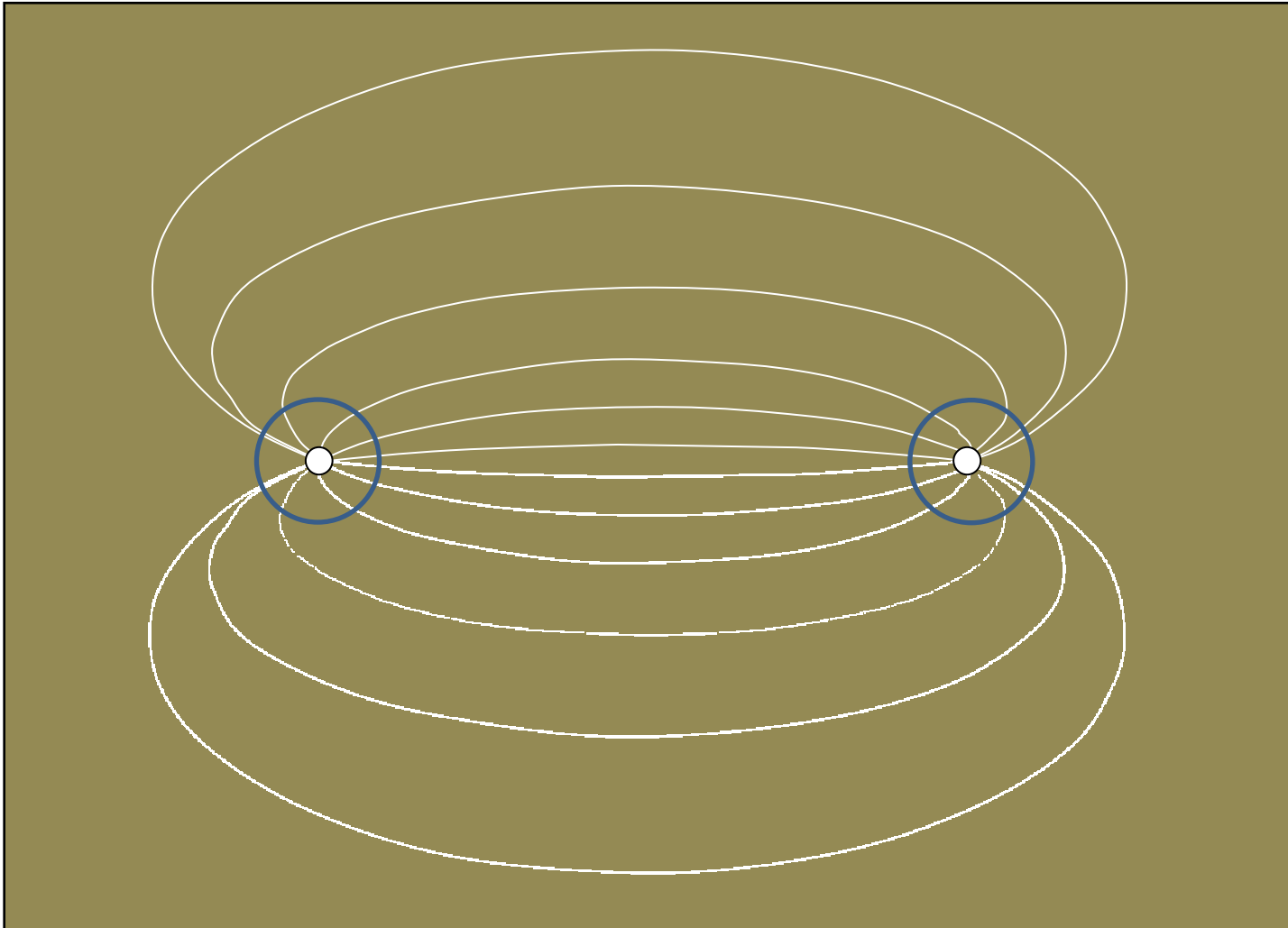
Hohe Transmissibilität ( $T \approx 10 \text{ D}\cdot\text{m}$ )

Beispiel: Neustadt-Glewe



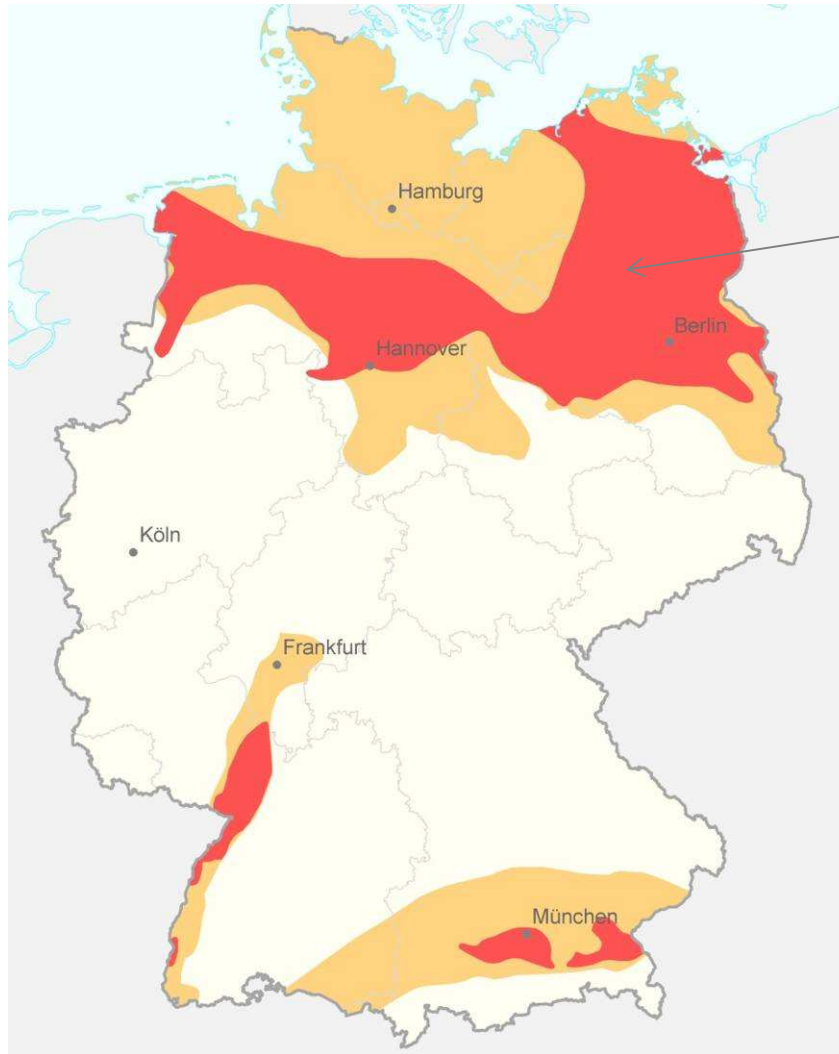
Quelle: GTN

Hohe Transmissibilität ( $T \cong 10 \text{ D}\cdot\text{m}$ )





## Mittlere Transmissibilität ( $T \cong 1 \text{ D}\cdot\text{m}$ )

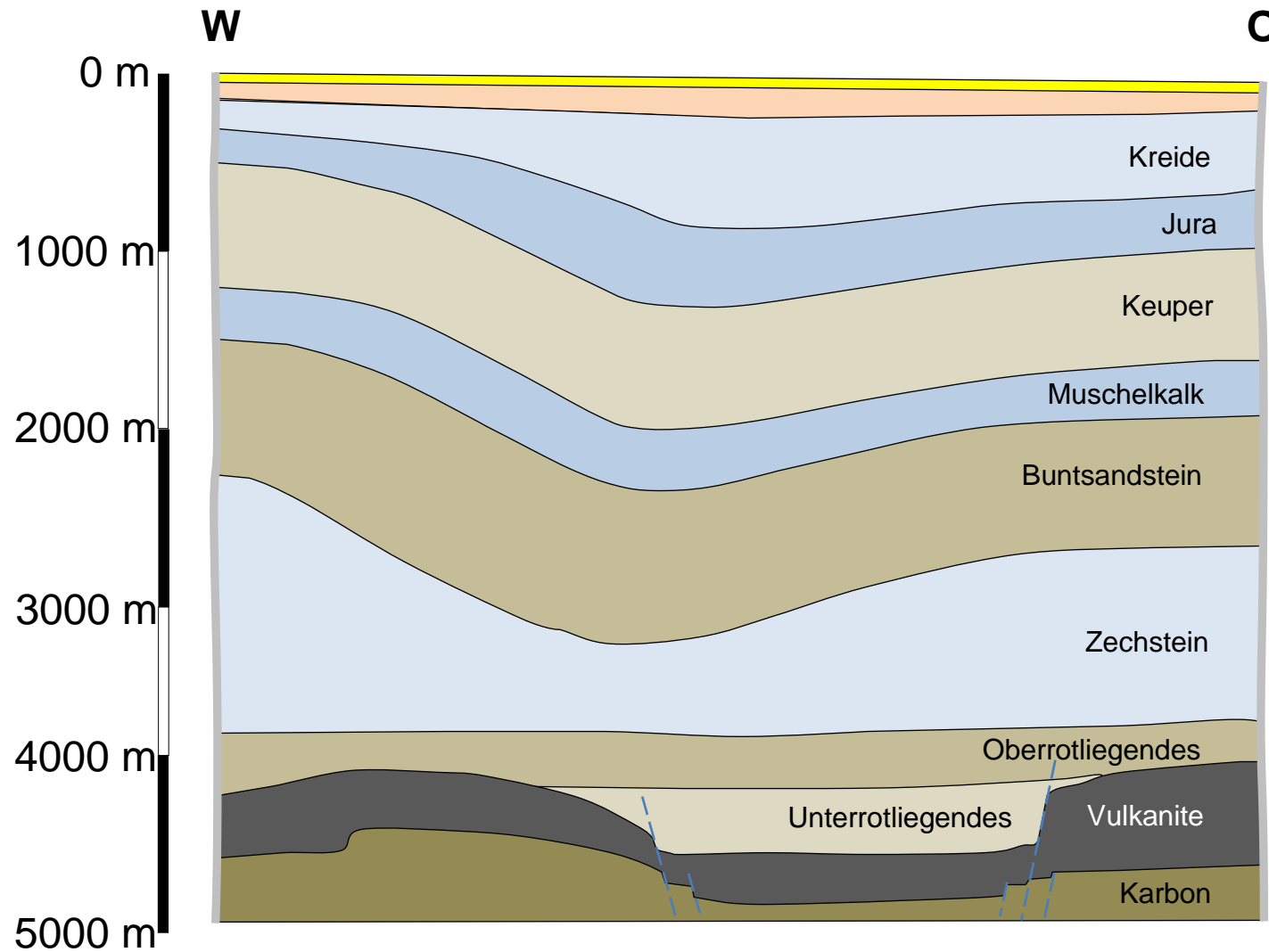


Rotliegend Sandsteine

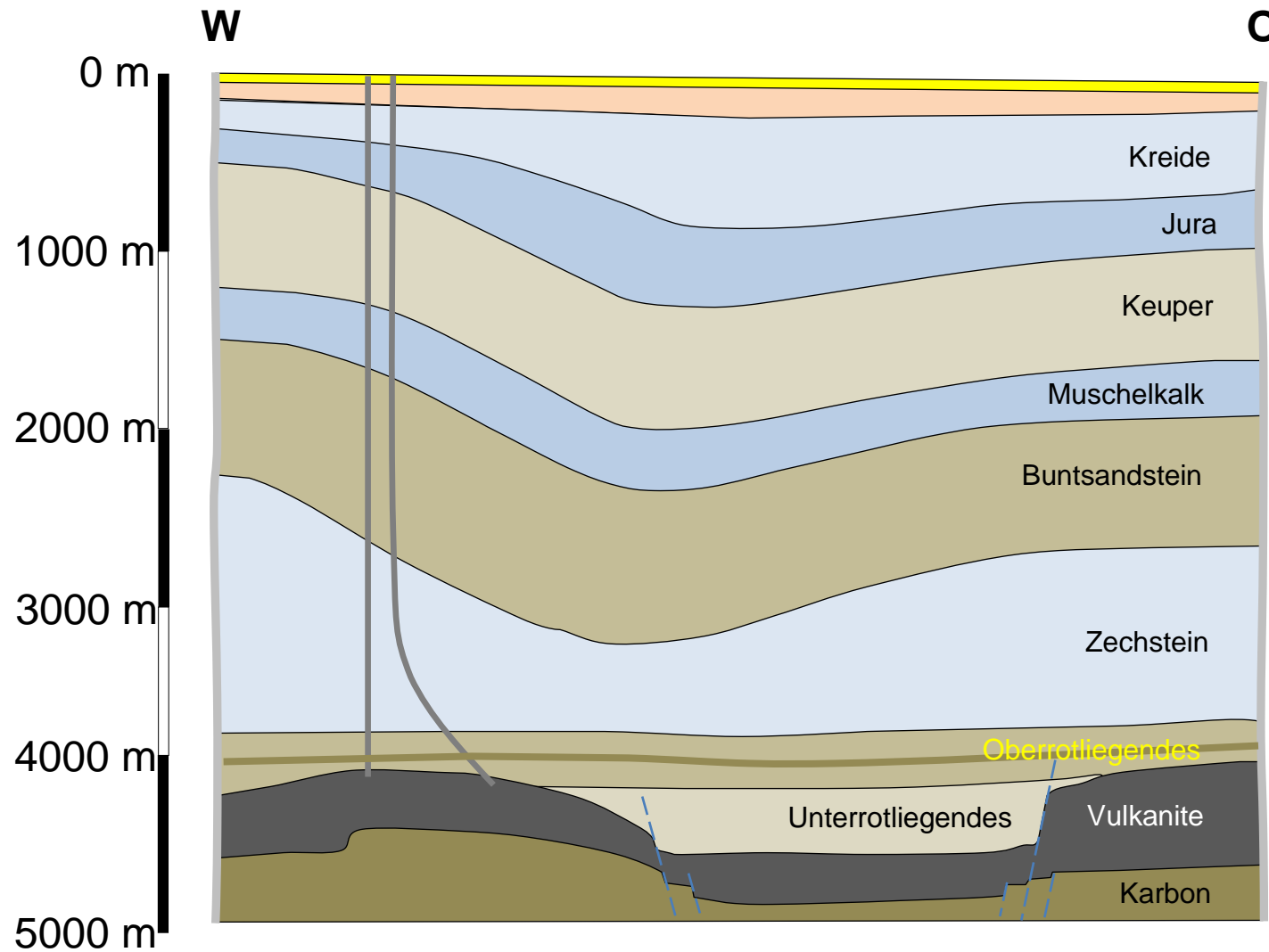
Strompotenzial: 7 EJ

Quelle: GGA-Hannover

# Mittlere Transmissibilität ( $T \cong 1 \text{ D}\cdot\text{m}$ )

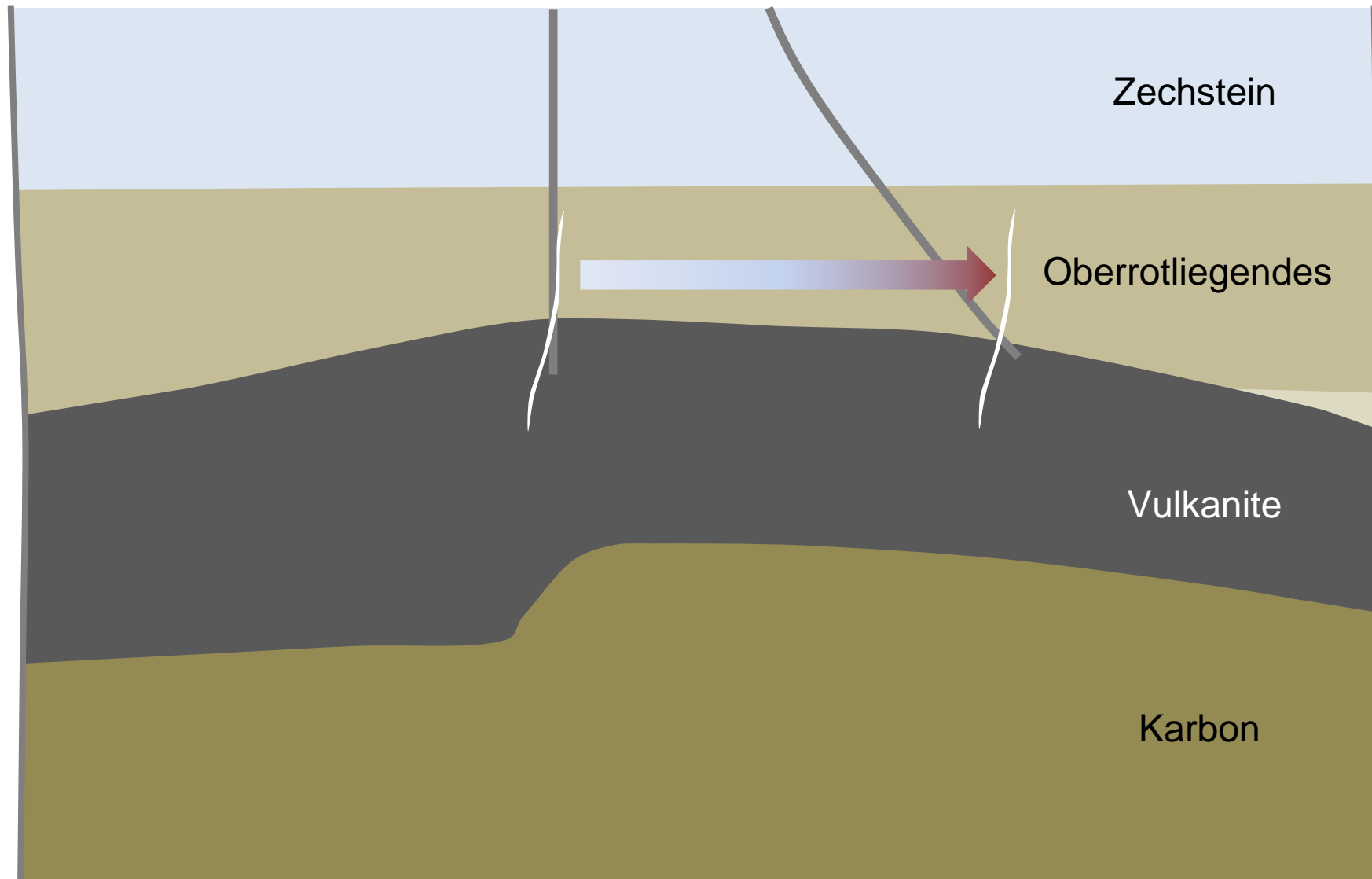


# Mittlere Transmissibilität ( $T \cong 1 \text{ D}\cdot\text{m}$ )



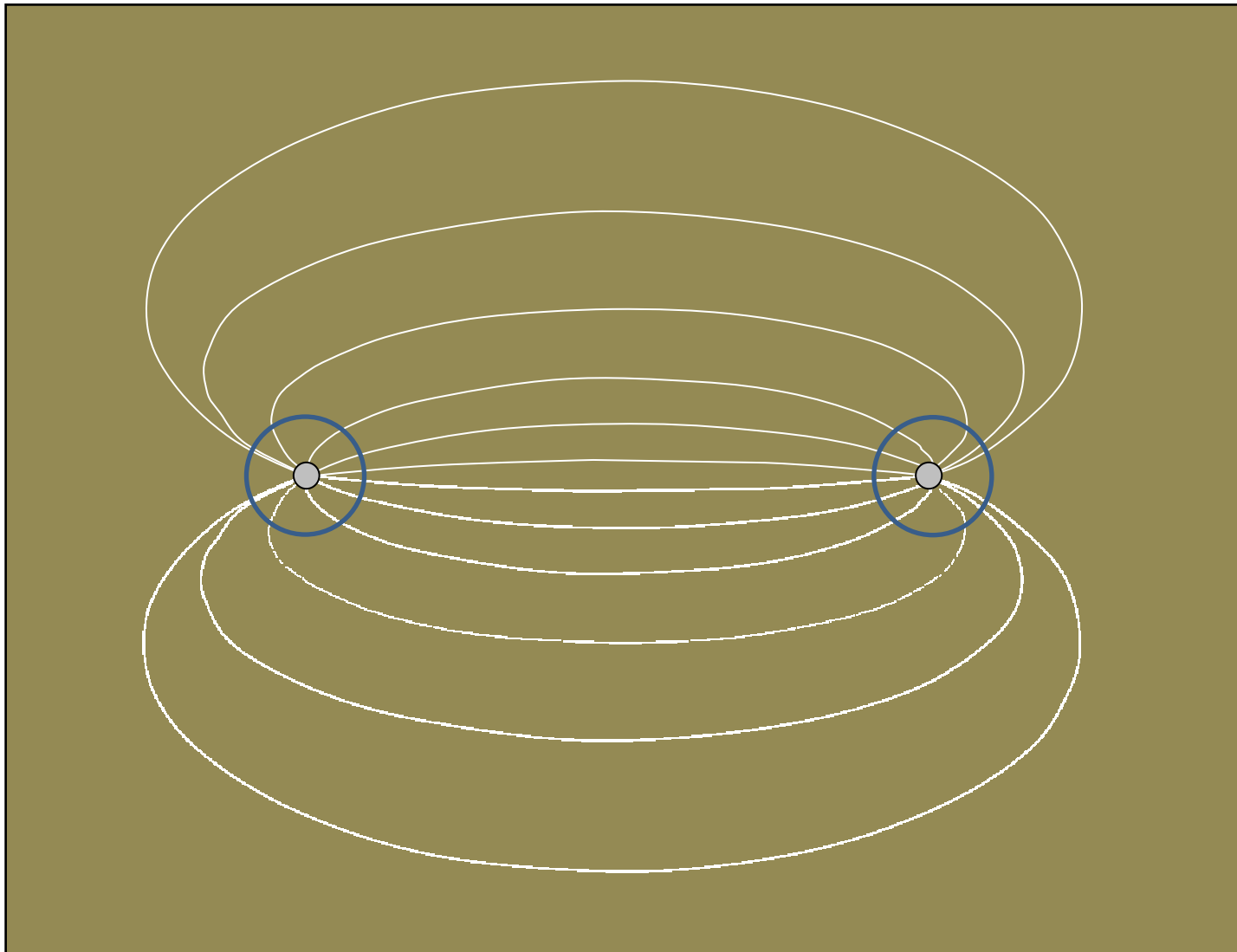
Mittlere Transmissibilität ( $T \cong 1 \text{ D}\cdot\text{m}$ )

Großschönebeck  
GFZ, Potsdam



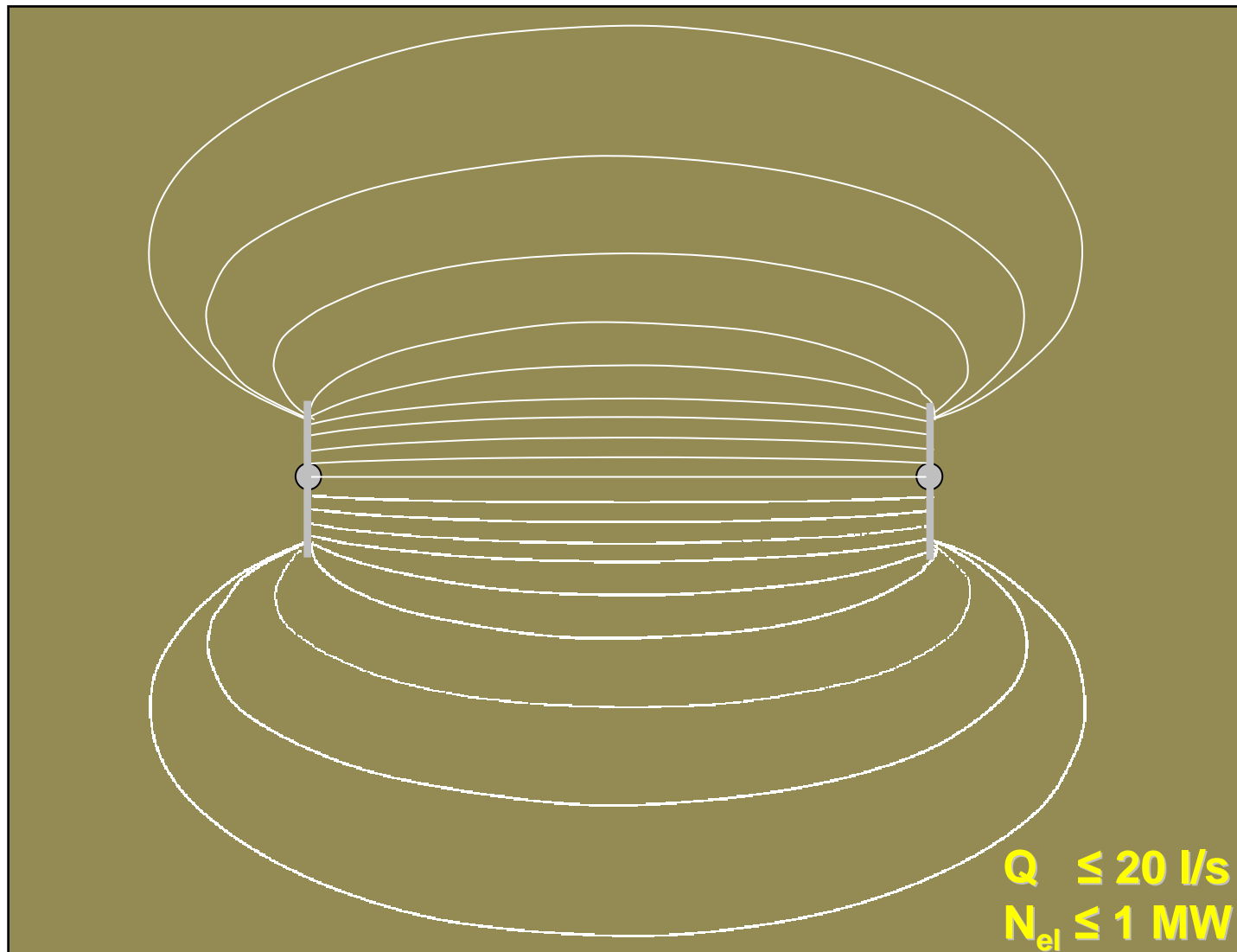
Mittlere Transmissibilität ( $T \cong 1 \text{ D}\cdot\text{m}$ )

Großschönebeck  
GFZ, Potsdam

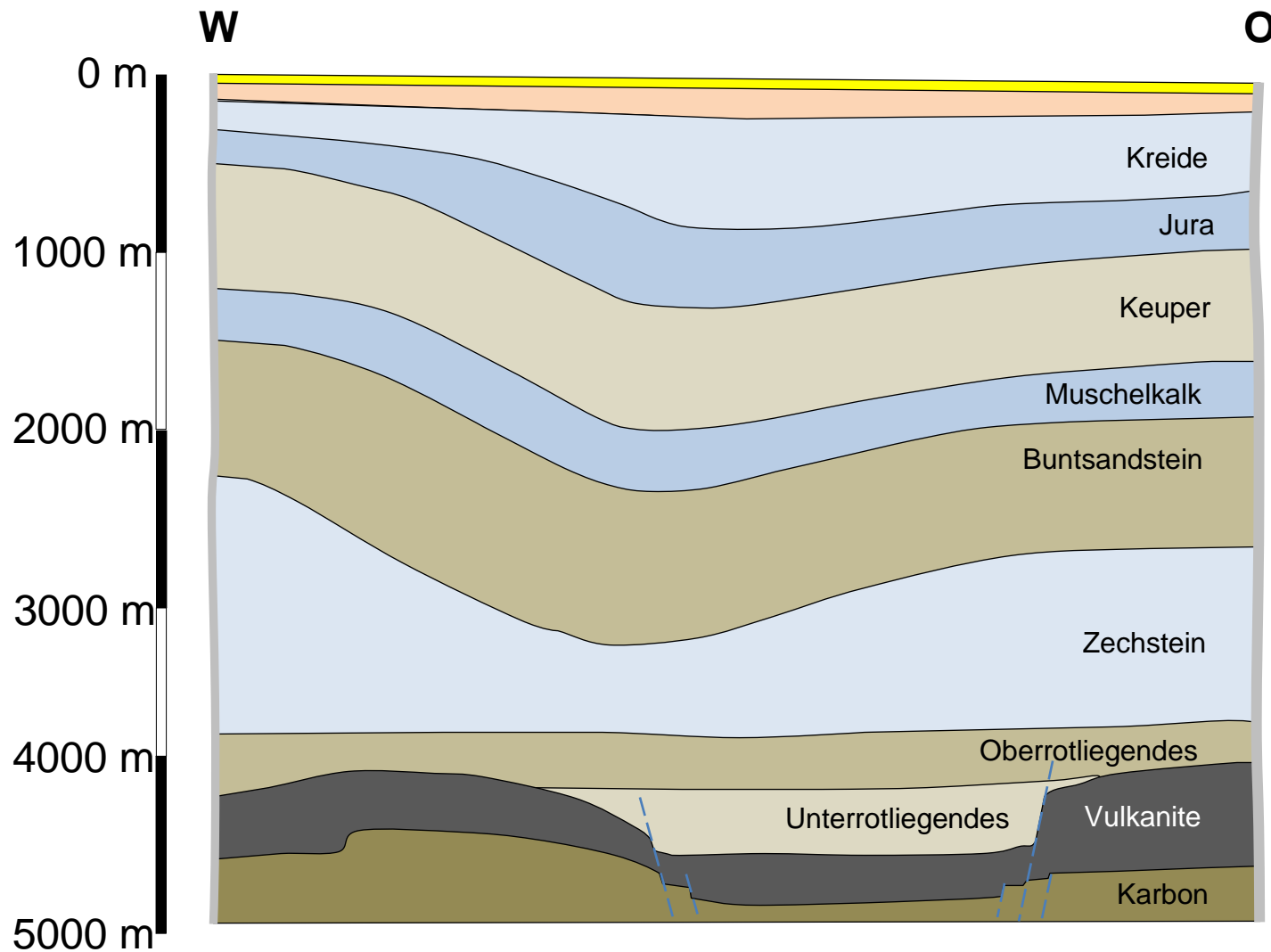


Mittlere Transmissibilität ( $T \cong 1 \text{ D}\cdot\text{m}$ )

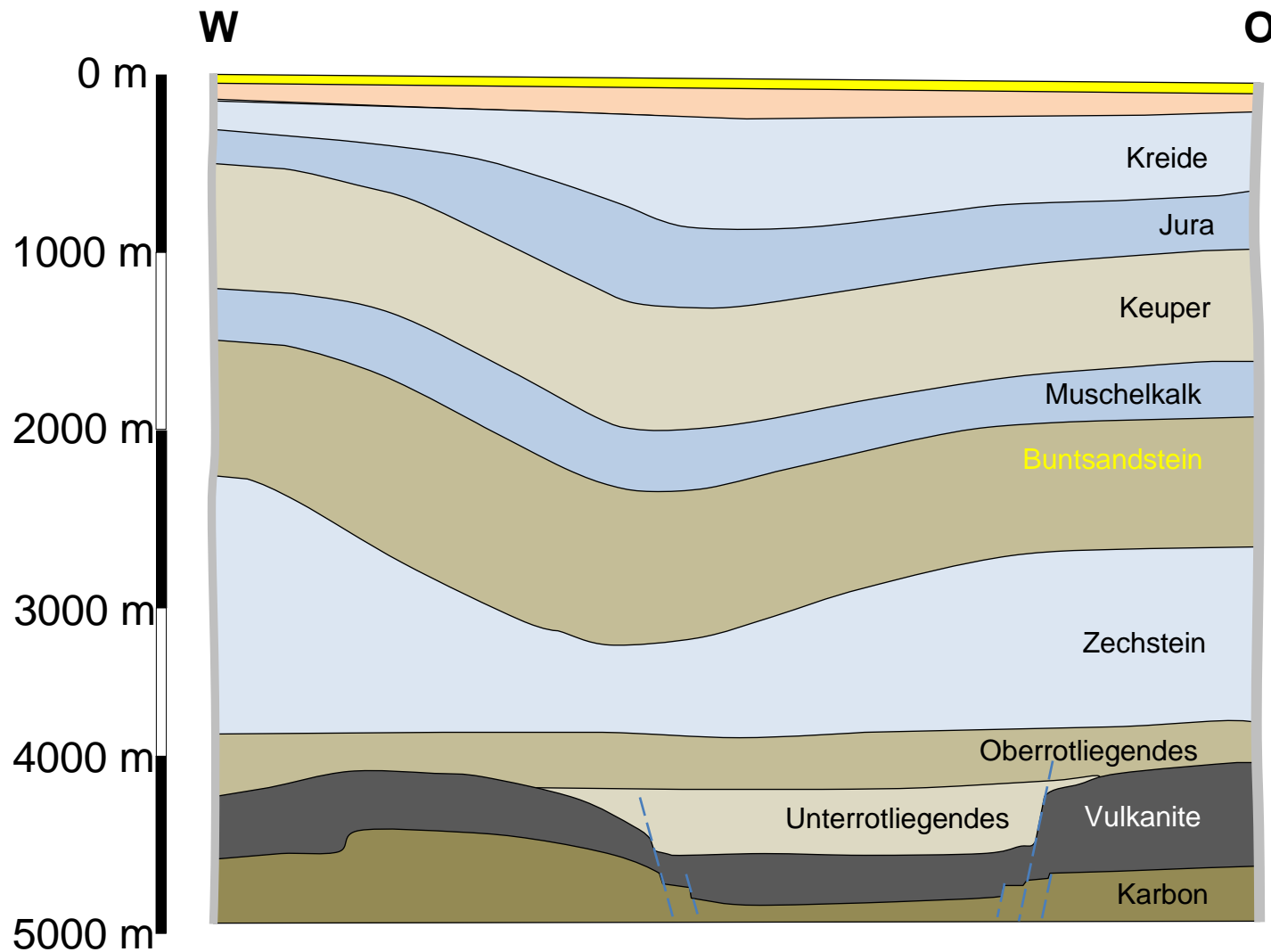
Großschönebeck  
GFZ, Potsdam



# Geringe Transmissibilität ( $T \cong 0,1 \text{ D}\cdot\text{m}$ )

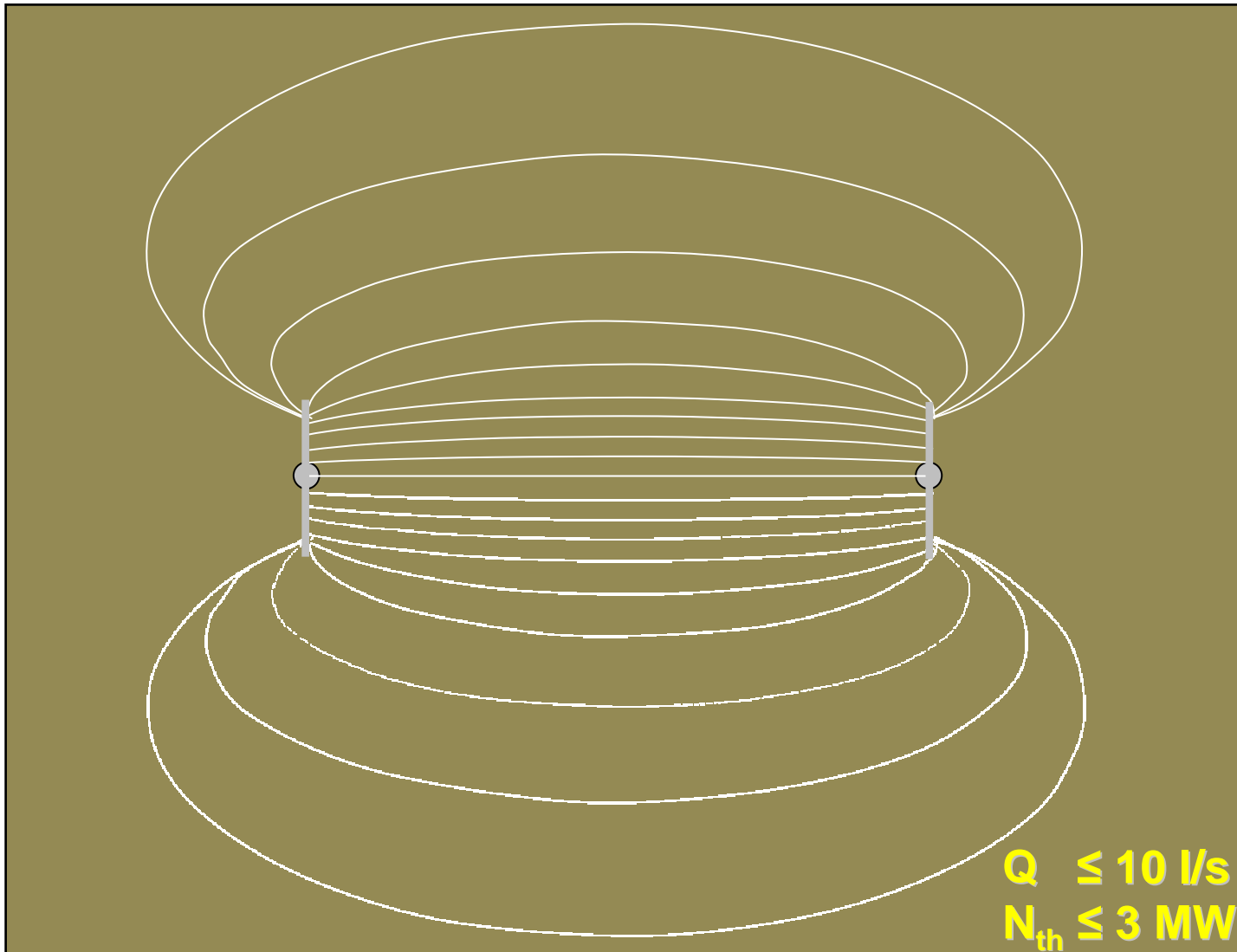


# Geringe Transmissibilität ( $T \cong 0,1 \text{ D}\cdot\text{m}$ )

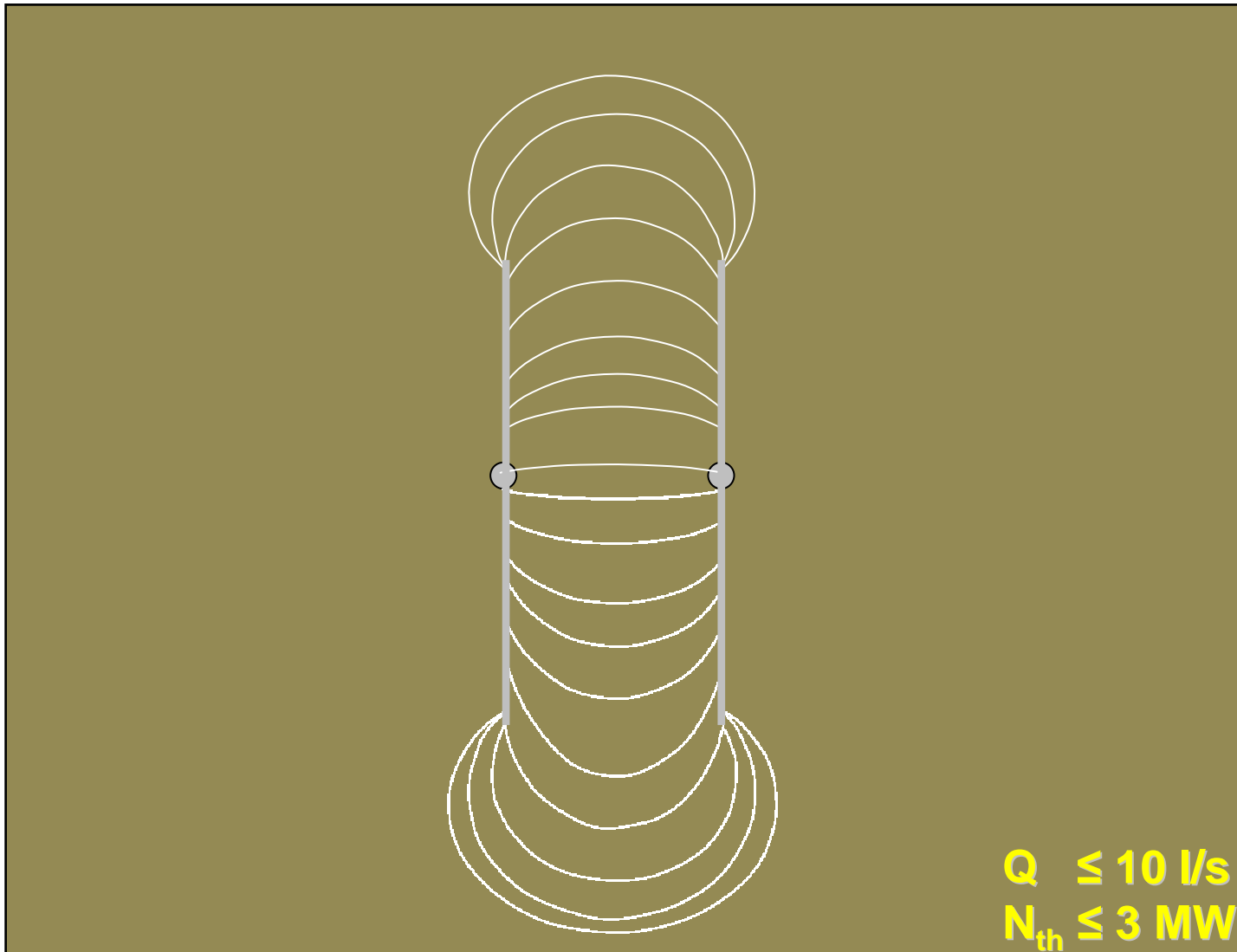




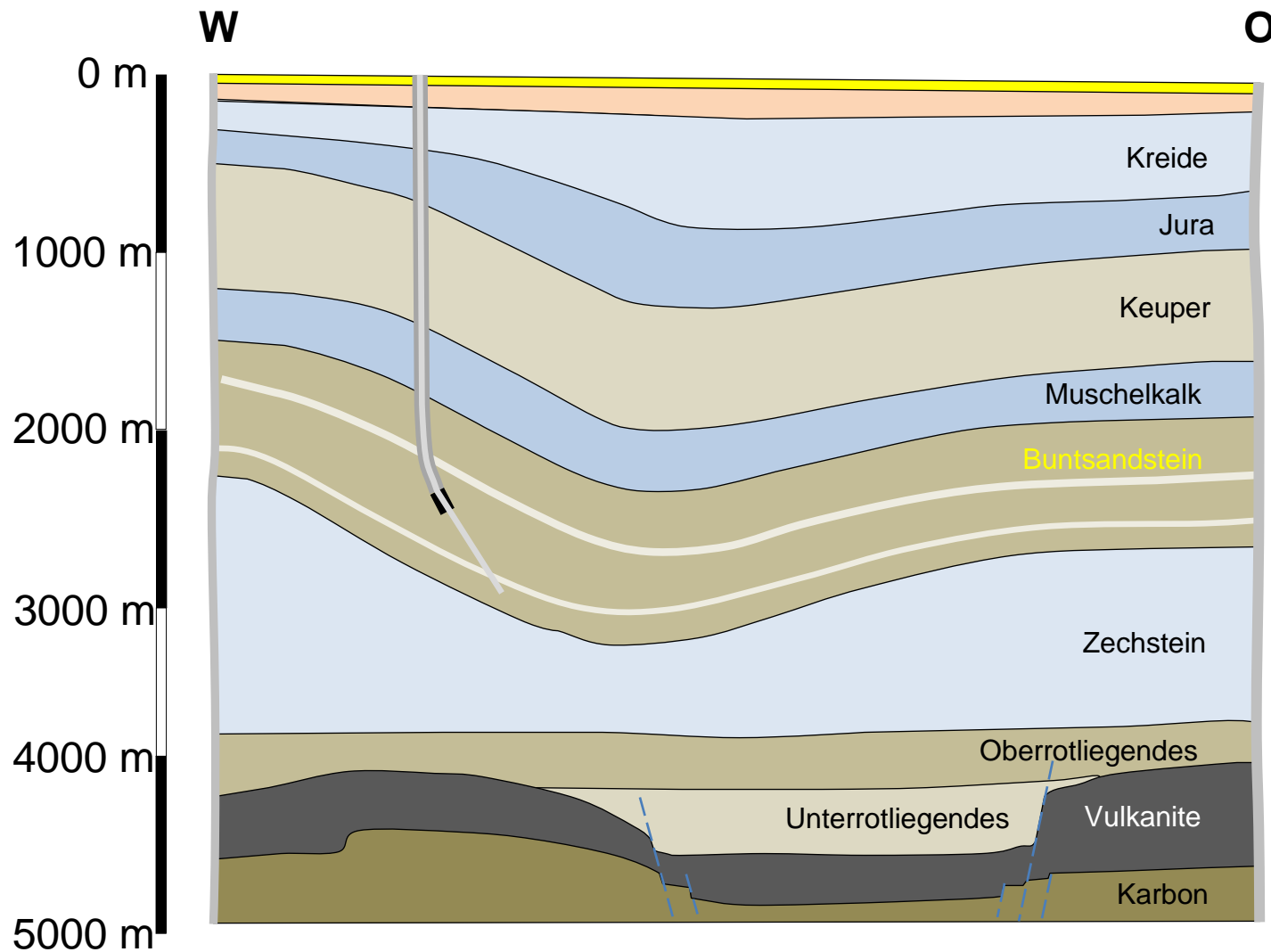
Geringe Transmissibilität ( $T \cong 0,1 \text{ D}\cdot\text{m}$ )



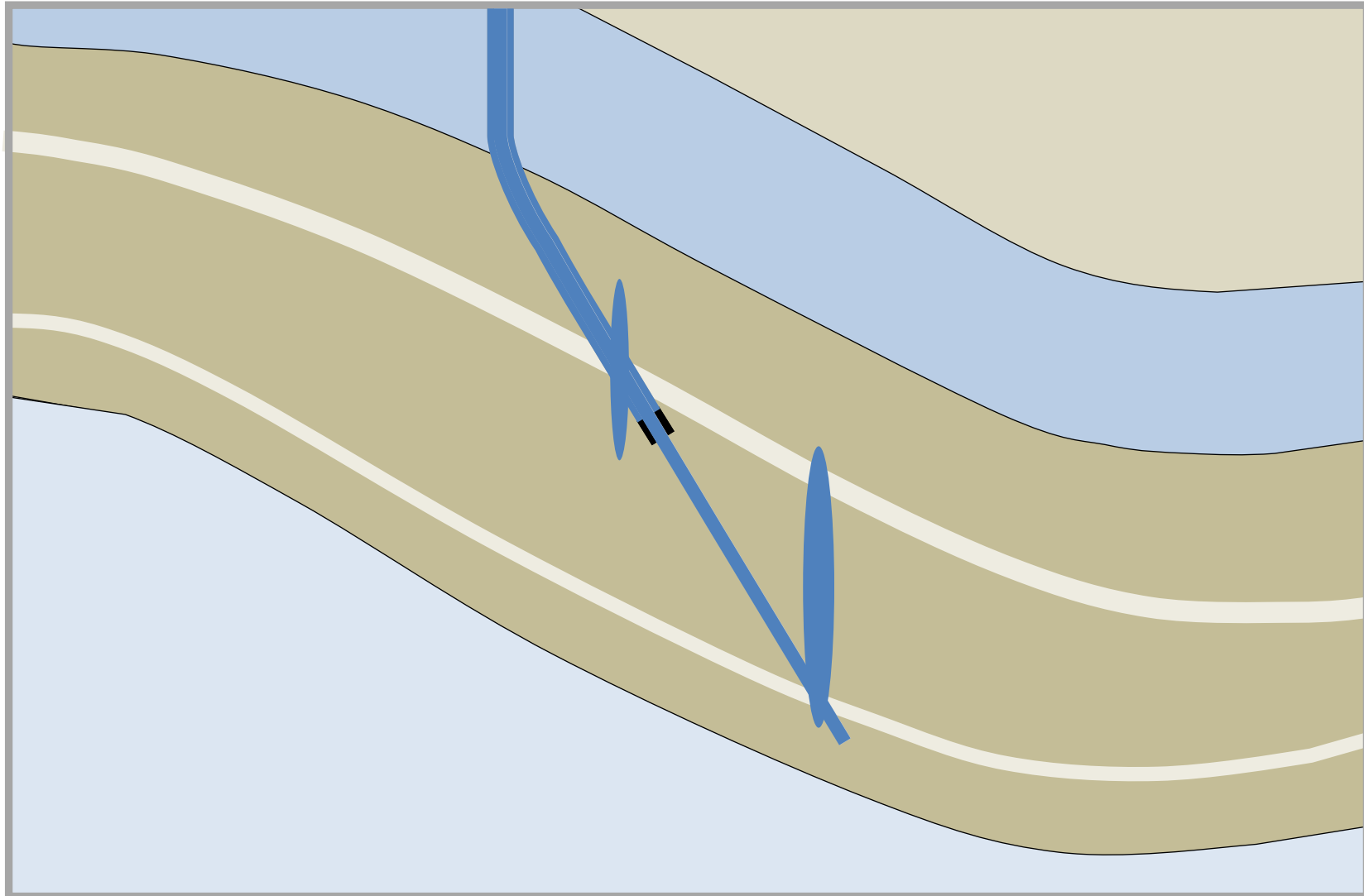
Geringe Transmissibilität ( $T \cong 0,1 \text{ D}\cdot\text{m}$ ) Großschönebeck  
GFZ, Potsdam



# Geringe Transmissibilität ( $T \cong 0,1 \text{ D}\cdot\text{m}$ )

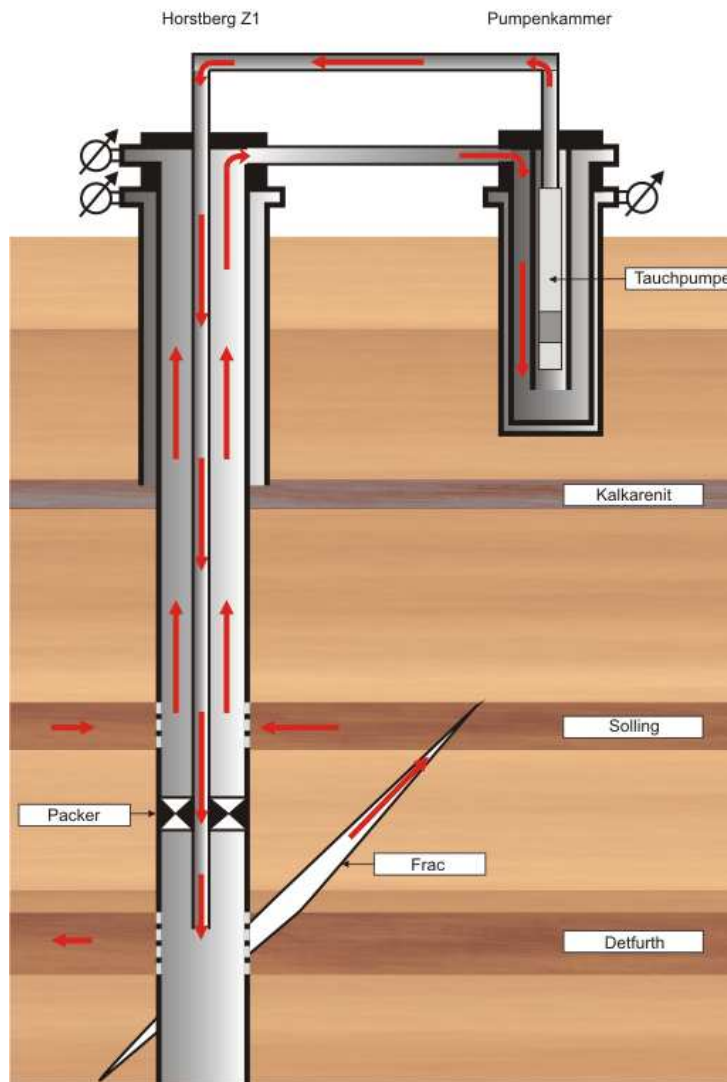


Geringe Transmissibilität ( $T \cong 0,1 \text{ D}\cdot\text{m}$ )



# Geringe Transmissibilität ( $T \cong 0,1 \text{ D}\cdot\text{m}$ )

## Tiefenzirkulation Horstberg Z1

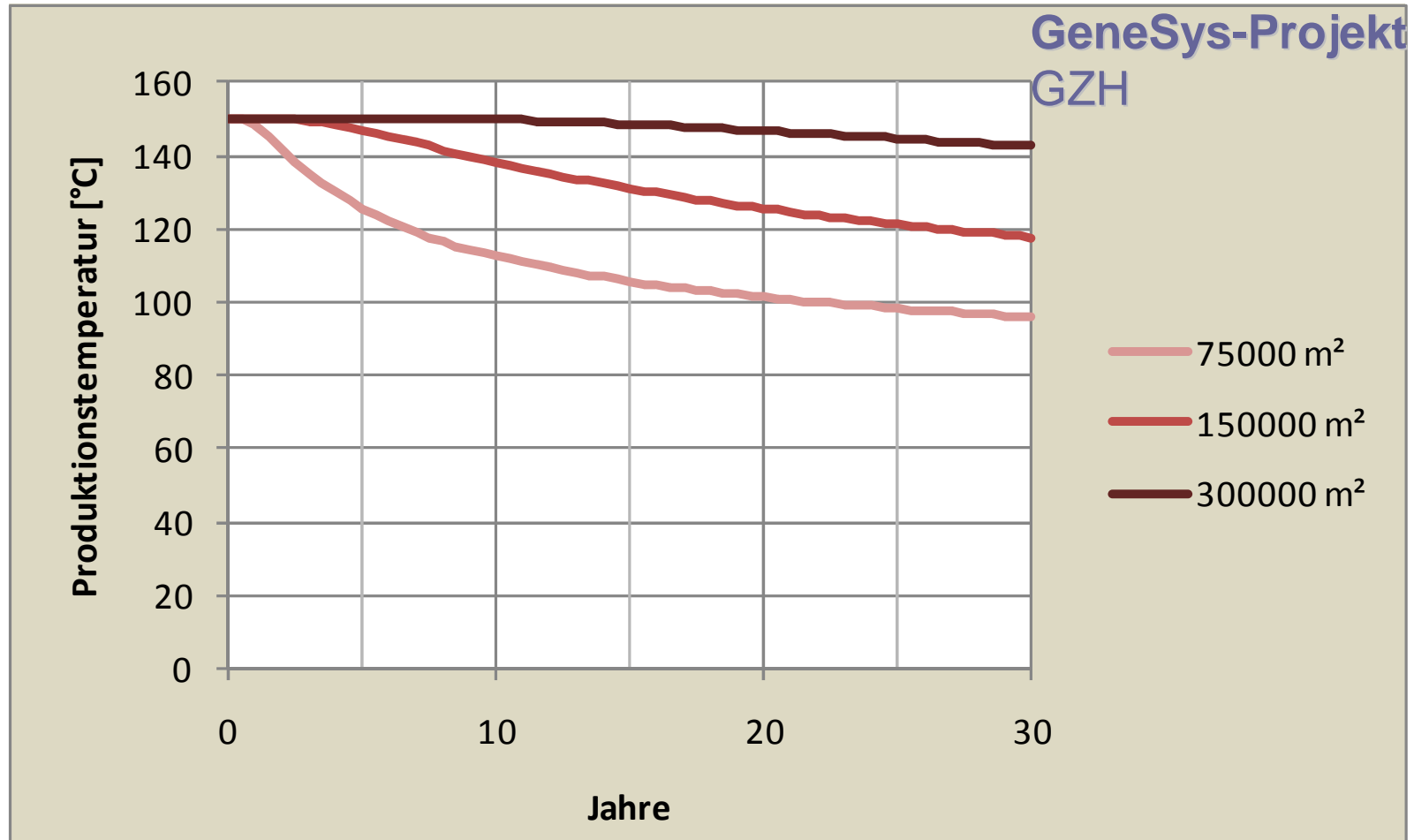


## GeneSys-Projekt Horstberg

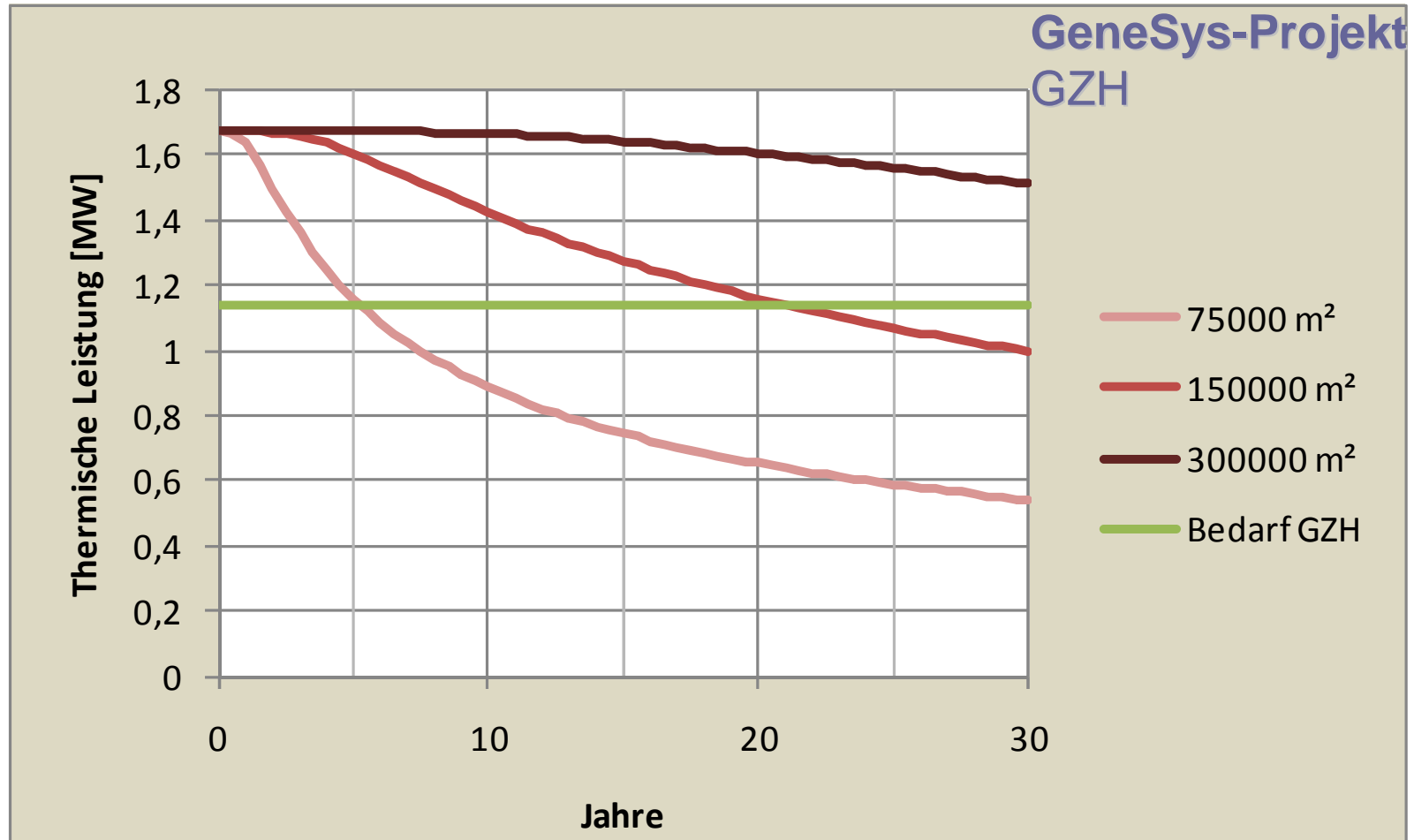
$$Q = 5 \text{ l/s}$$

Quelle: GGA, Hannover

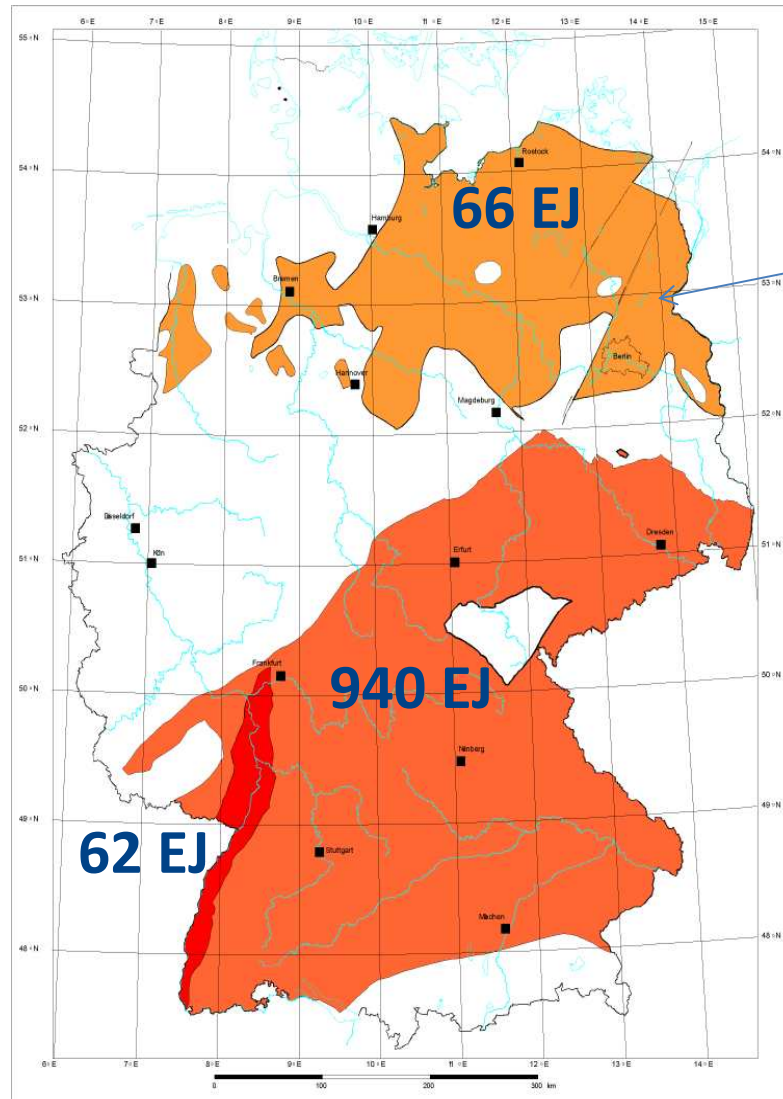
## Geringe Transmissibilität ( $T \cong 0,1 \text{ D}\cdot\text{m}$ )



## Geringe Transmissibilität ( $T \cong 0,1 \text{ D}\cdot\text{m}$ )



## Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )

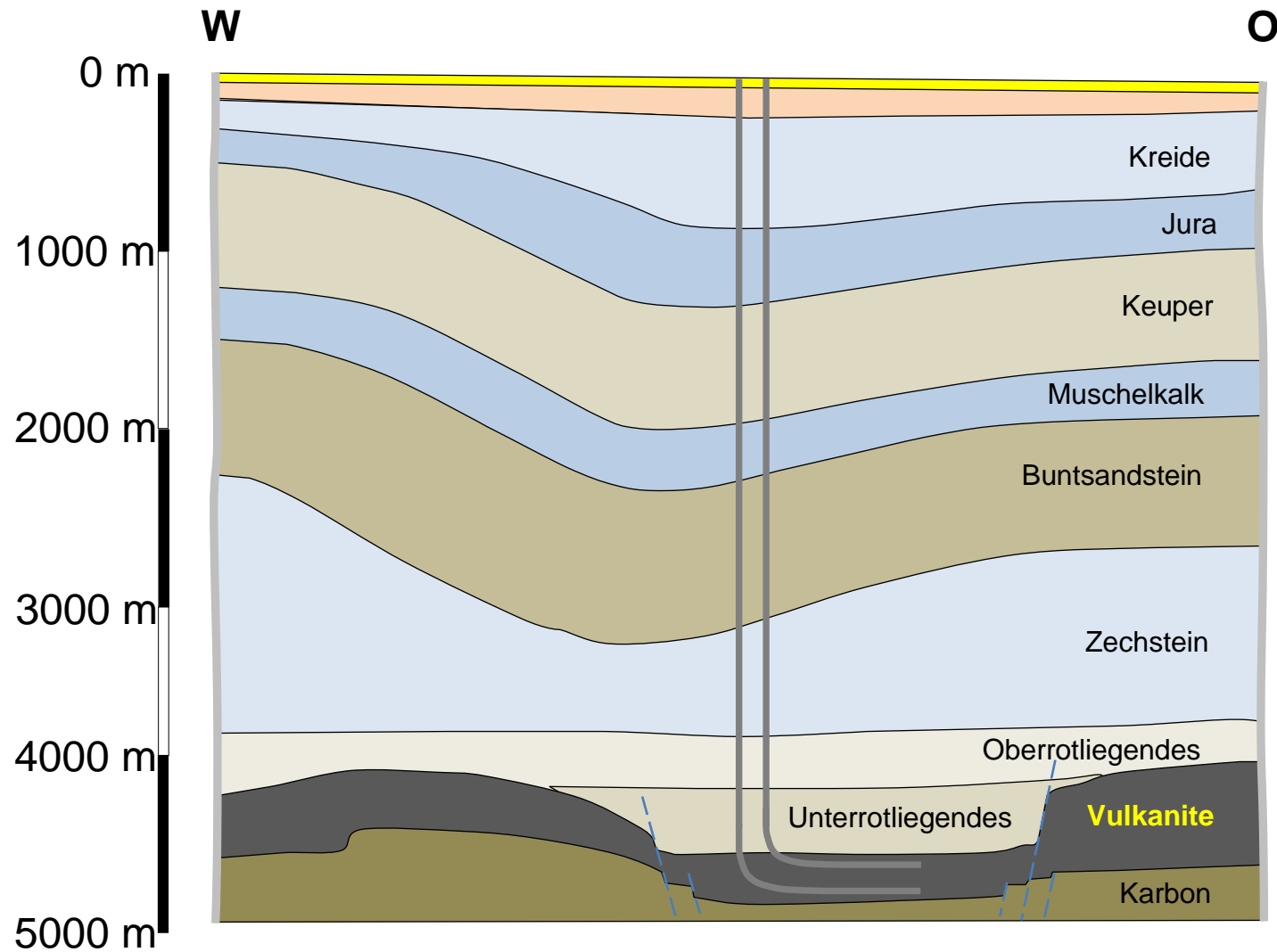


Rotliegend Vulkanite

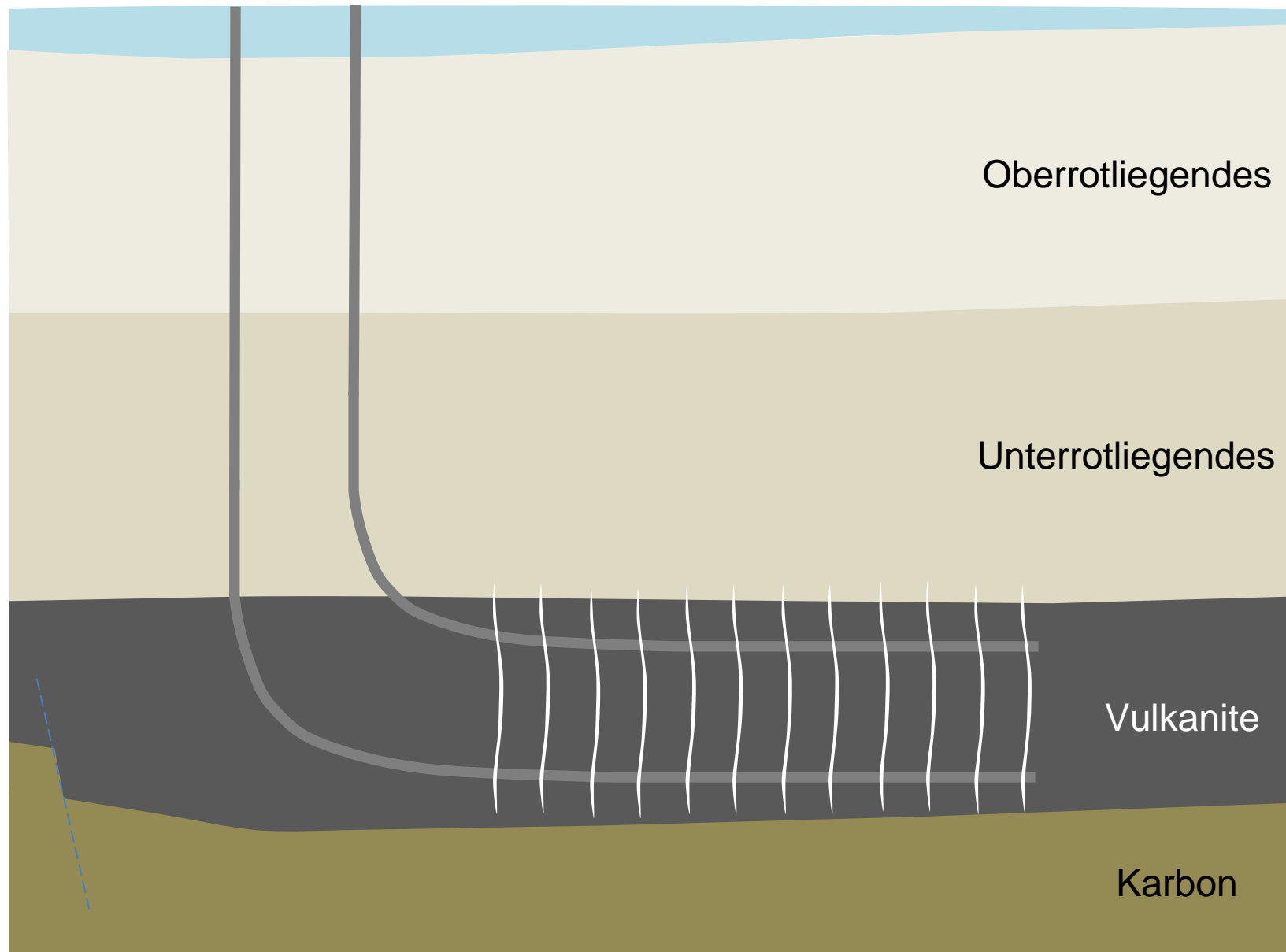
Abb. 5.3.1 ■ Verbreitung Granit in 3000m Tiefe (entsprechend 100°C)  
■ Verbreitung Granit im Oberrheingraben in 3000m Tiefe (entsprechend 130°C)  
■ Verbreitung der Rotliegendvulkanite mit Temperaturen größer 100°C



Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )

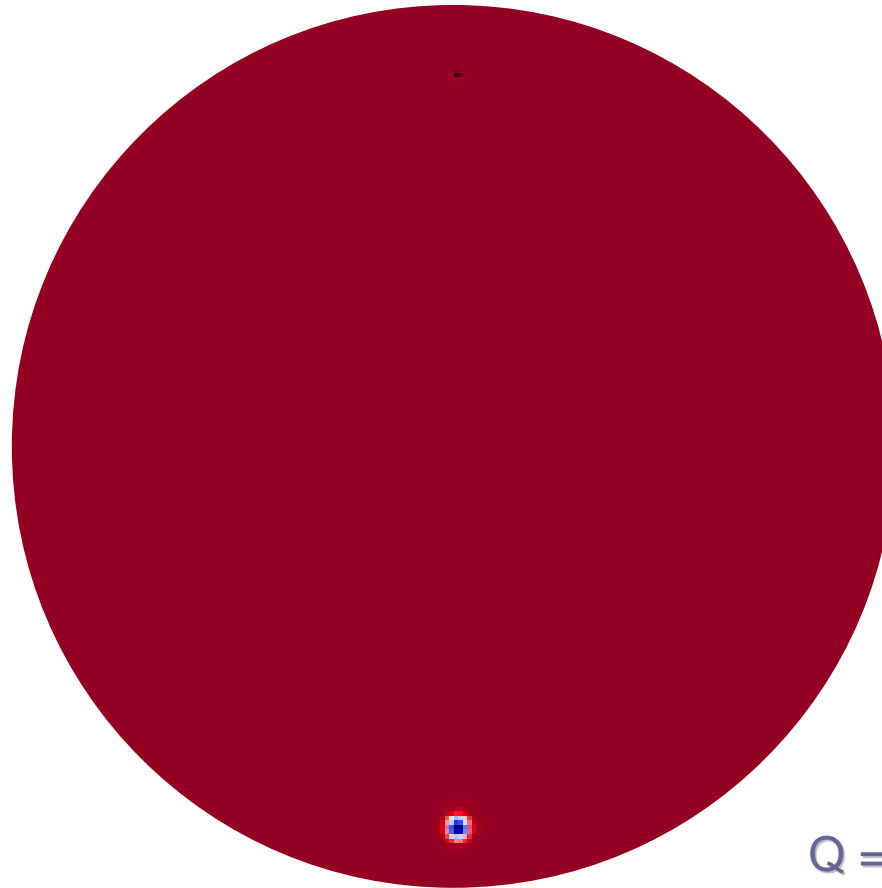


Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )



Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )

4 Tage

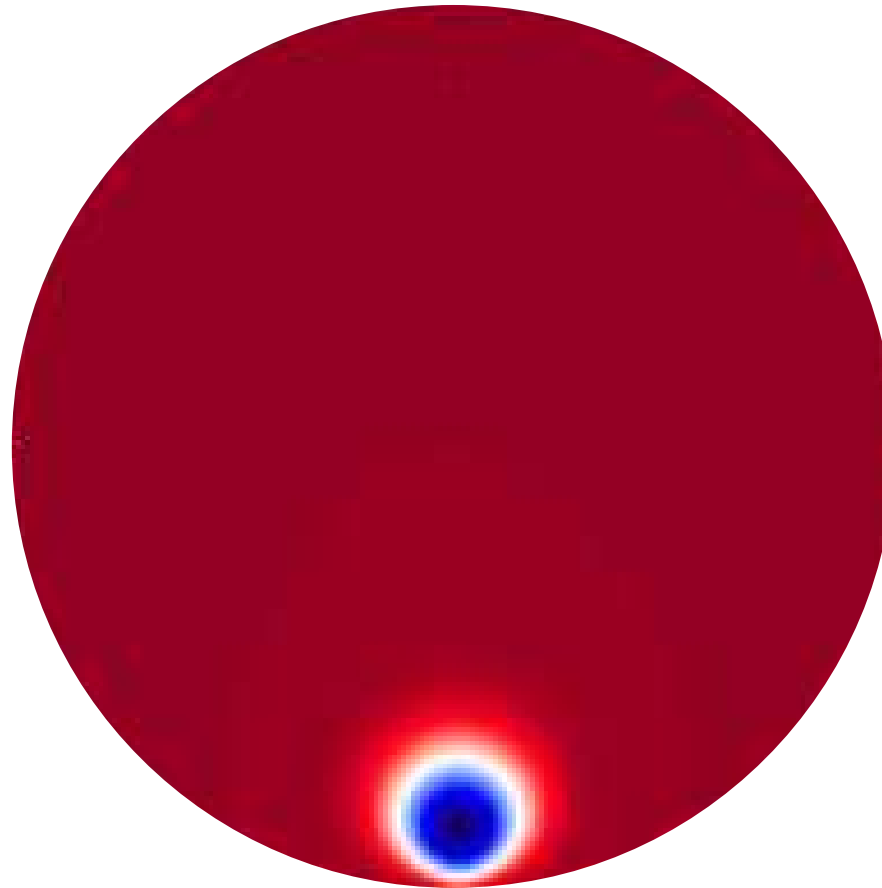


$Q = 100 \text{ l/s}$   
Bohrlochabstand 500 m

Quelle: GTC-Karlsruhe

Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )

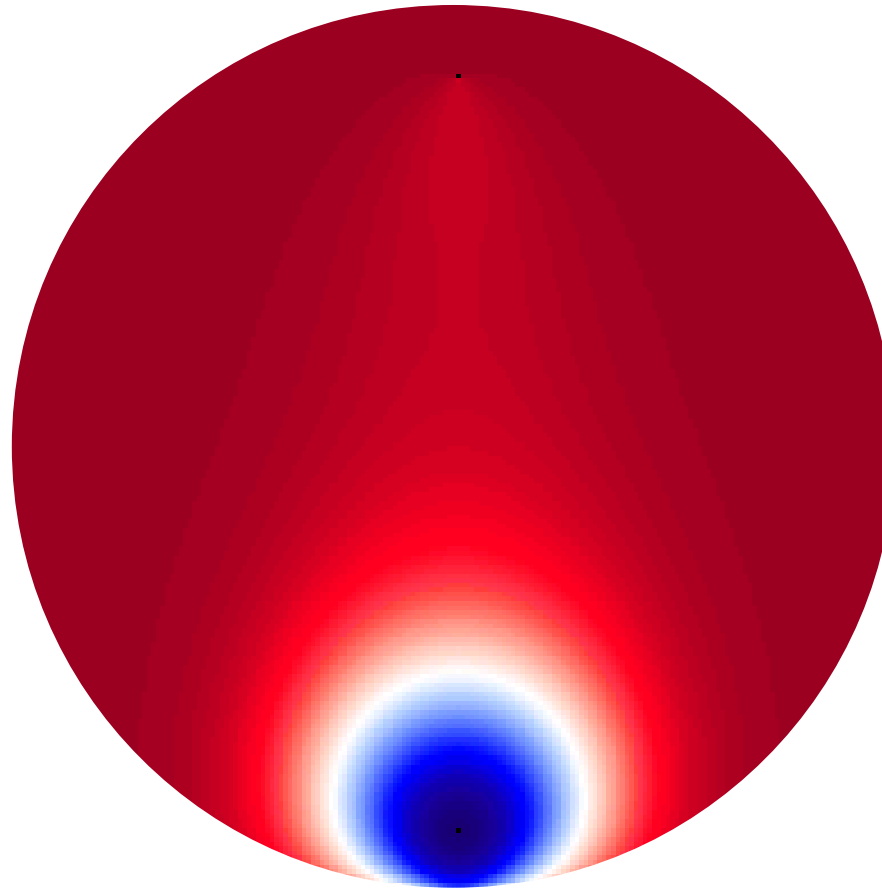
4 Monate



Quelle: GTC-Karlsruhe

Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )

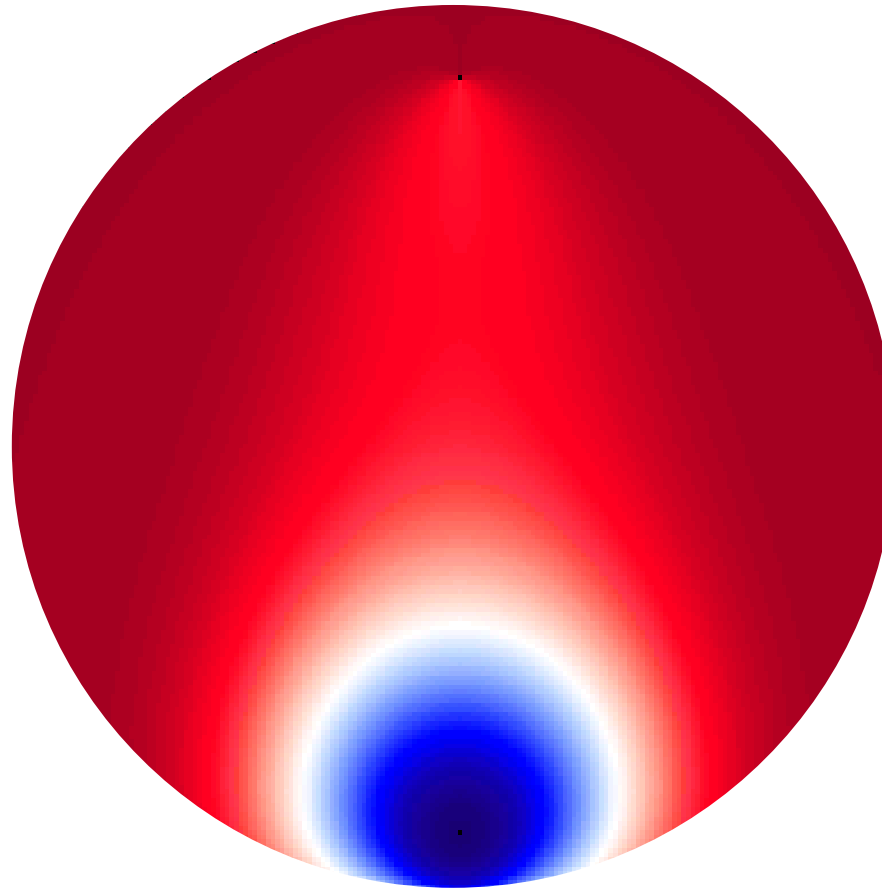
4 Jahre



Quelle: GTC-Karlsruhe

Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )

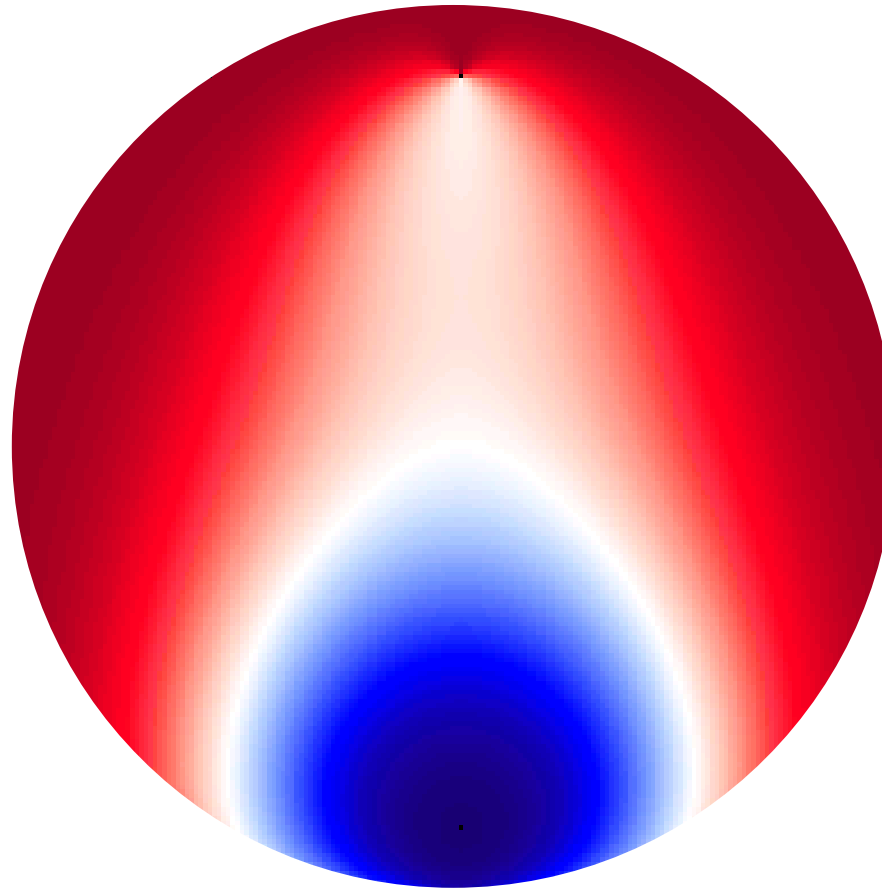
8 Jahre



Quelle: GTC-Karlsruhe

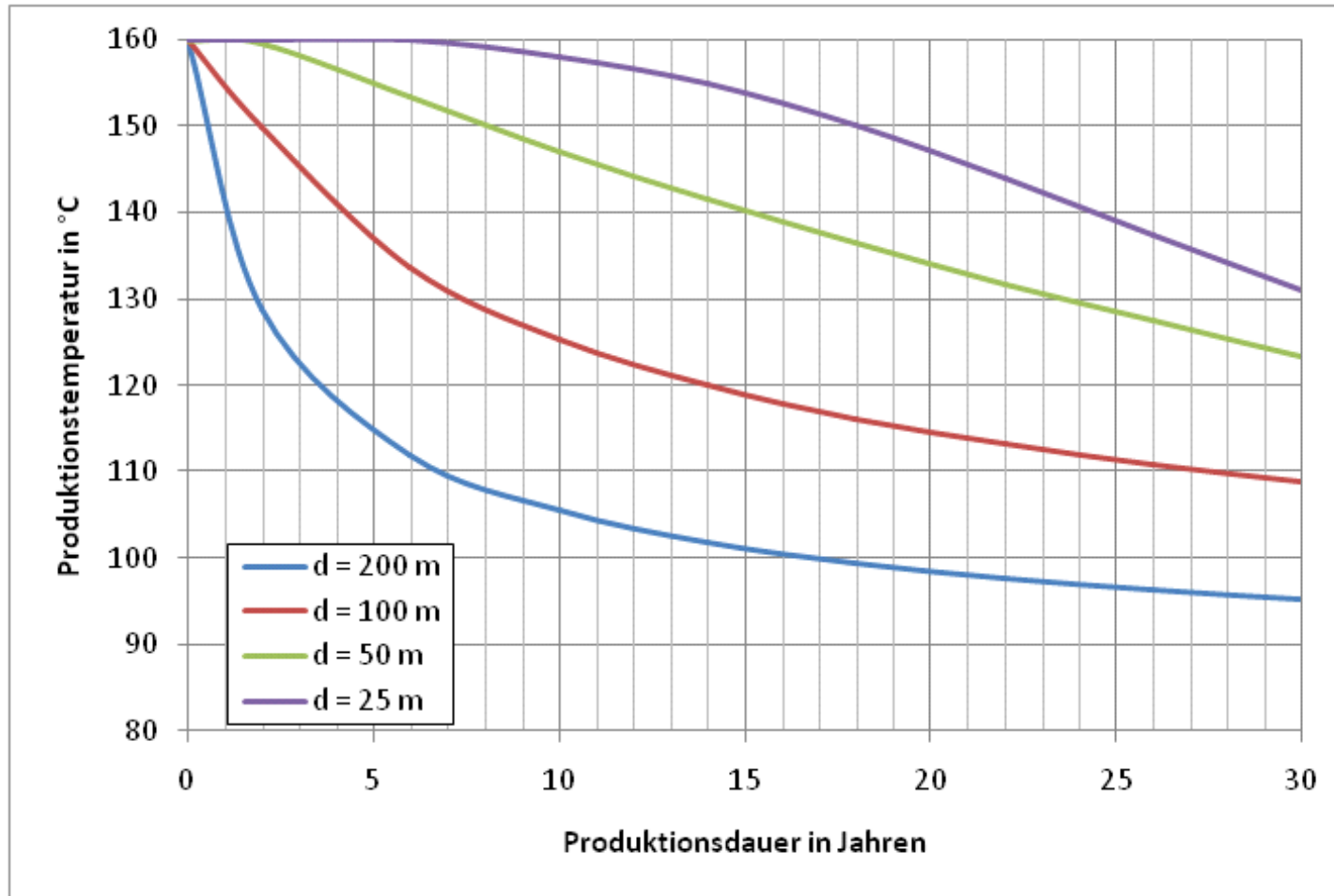
Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )

20 Jahre



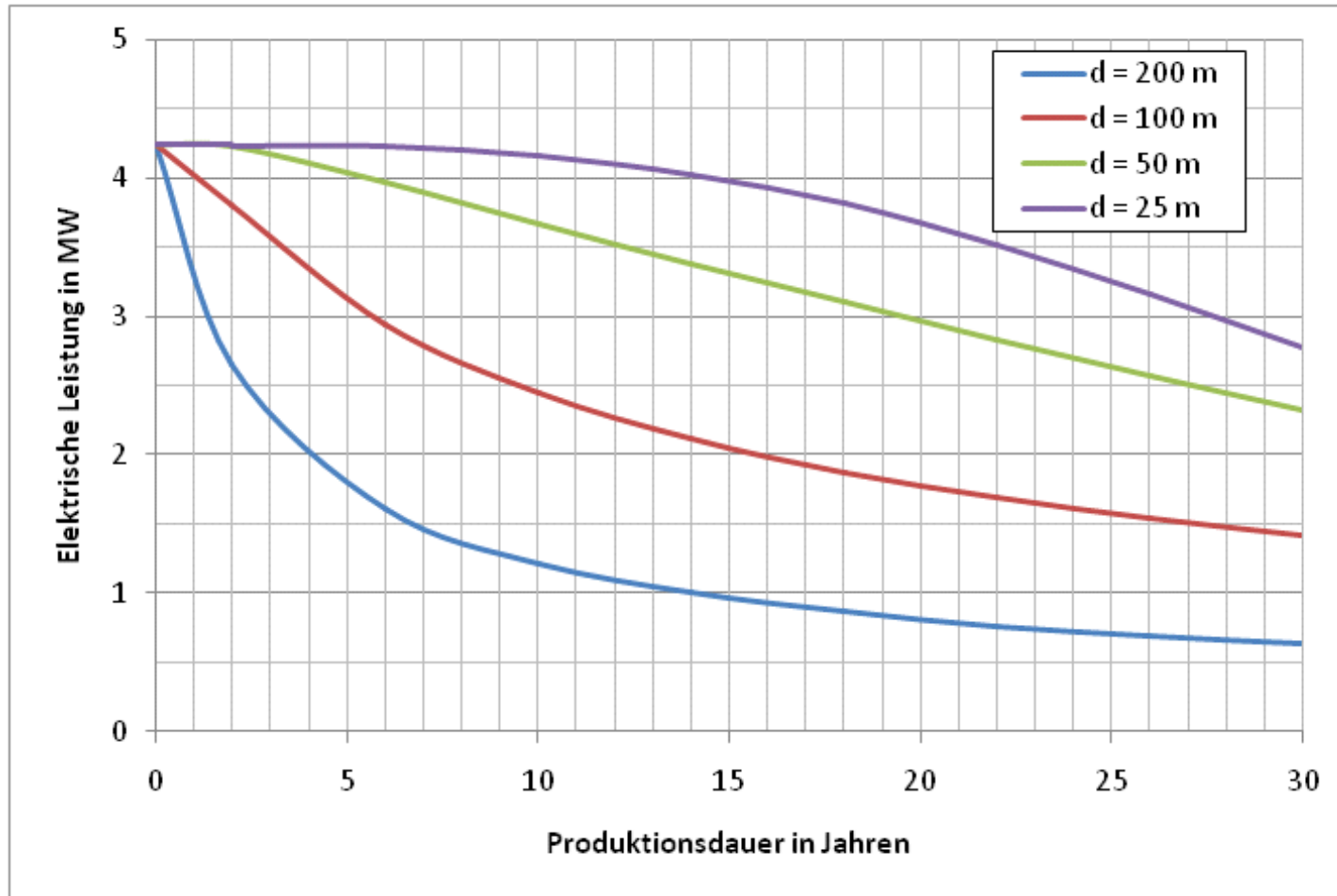
Quelle: GTC-Karlsruhe

## Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )

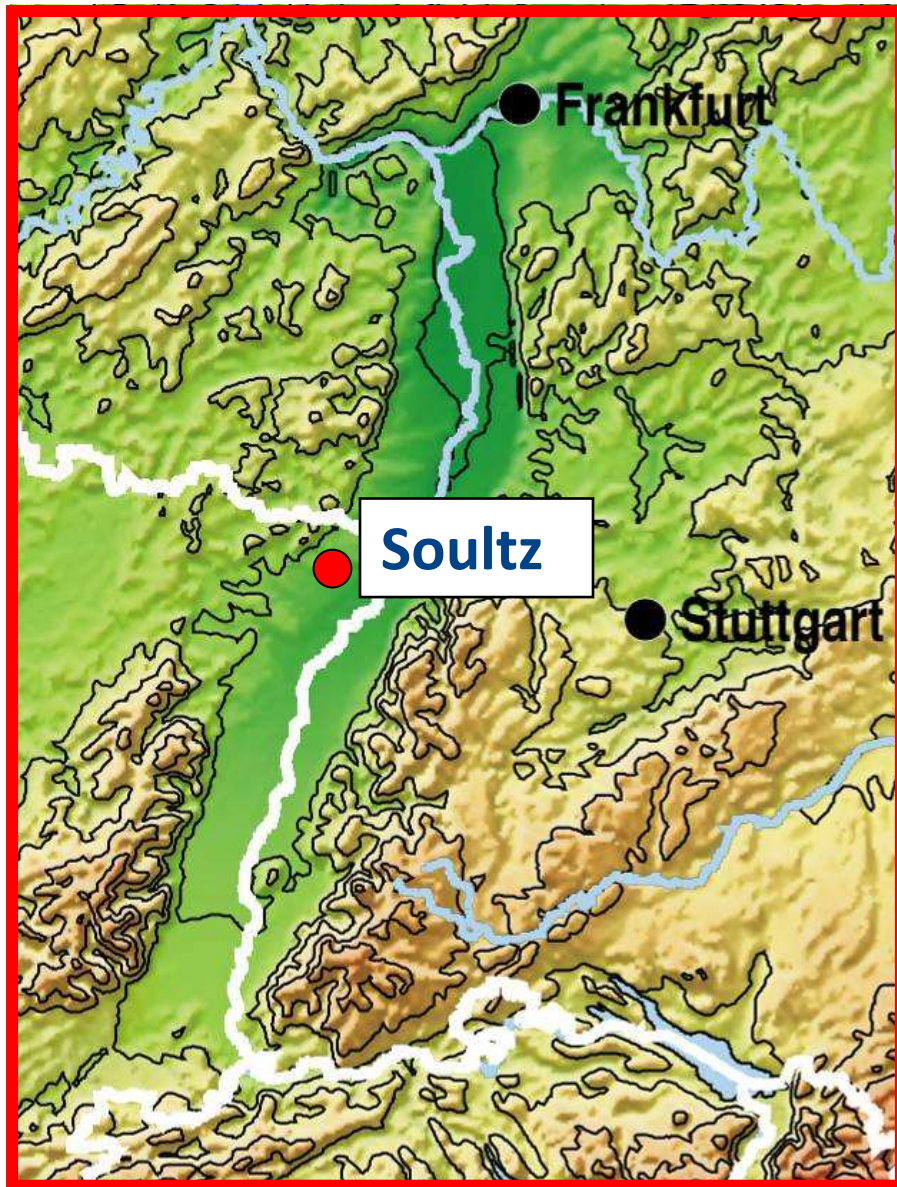




## Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )



Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )



Hot-Dry-Rock Projekt Soutz

Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )

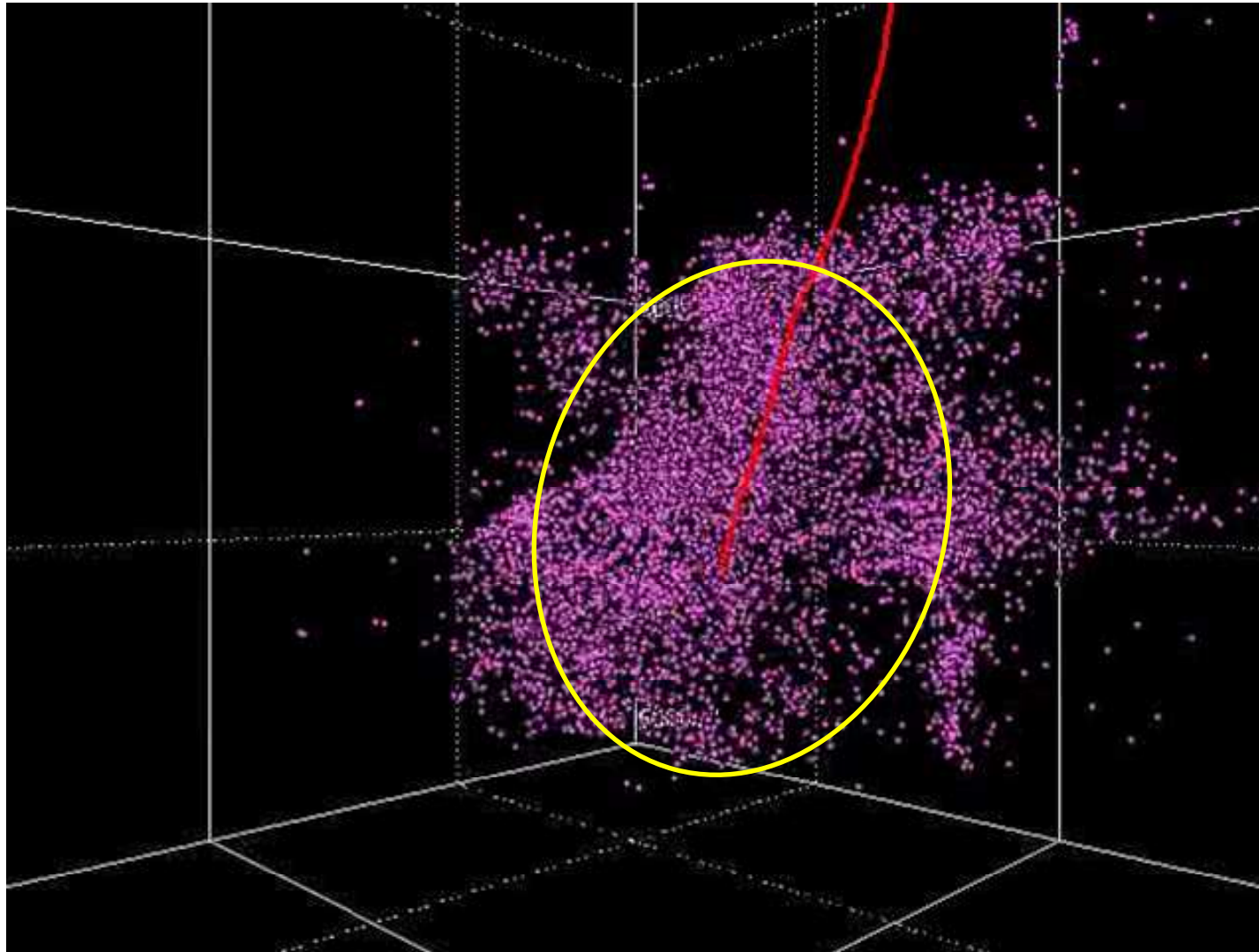


Wassereservoir: 1 ha, 2-3 m tief

Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )



Extrem geringe Transmissibilität ( $T \leq 0,001 \text{ D}\cdot\text{m}$ )



Quelle: Asanuma, Tohoku-Univ.

# Zusammenfassung

