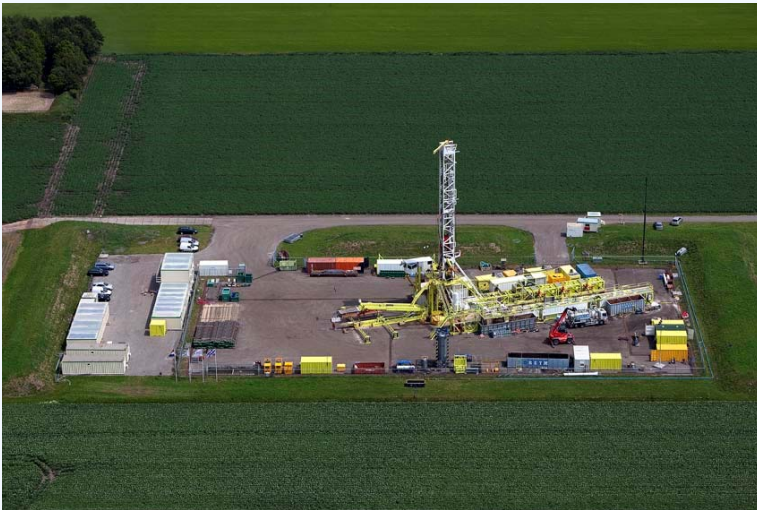


DAP Symposium 2019

Geothermal drilling in an urban area



Volkert
De Ruiter
Drilling Manager
WEP

DAP Symposium
Delft
Netherlands
12-03-2019

Drilling in an urban area

Projects in urban areas new?



Source: spoorzonedelft.nl

Drilling in an urban area

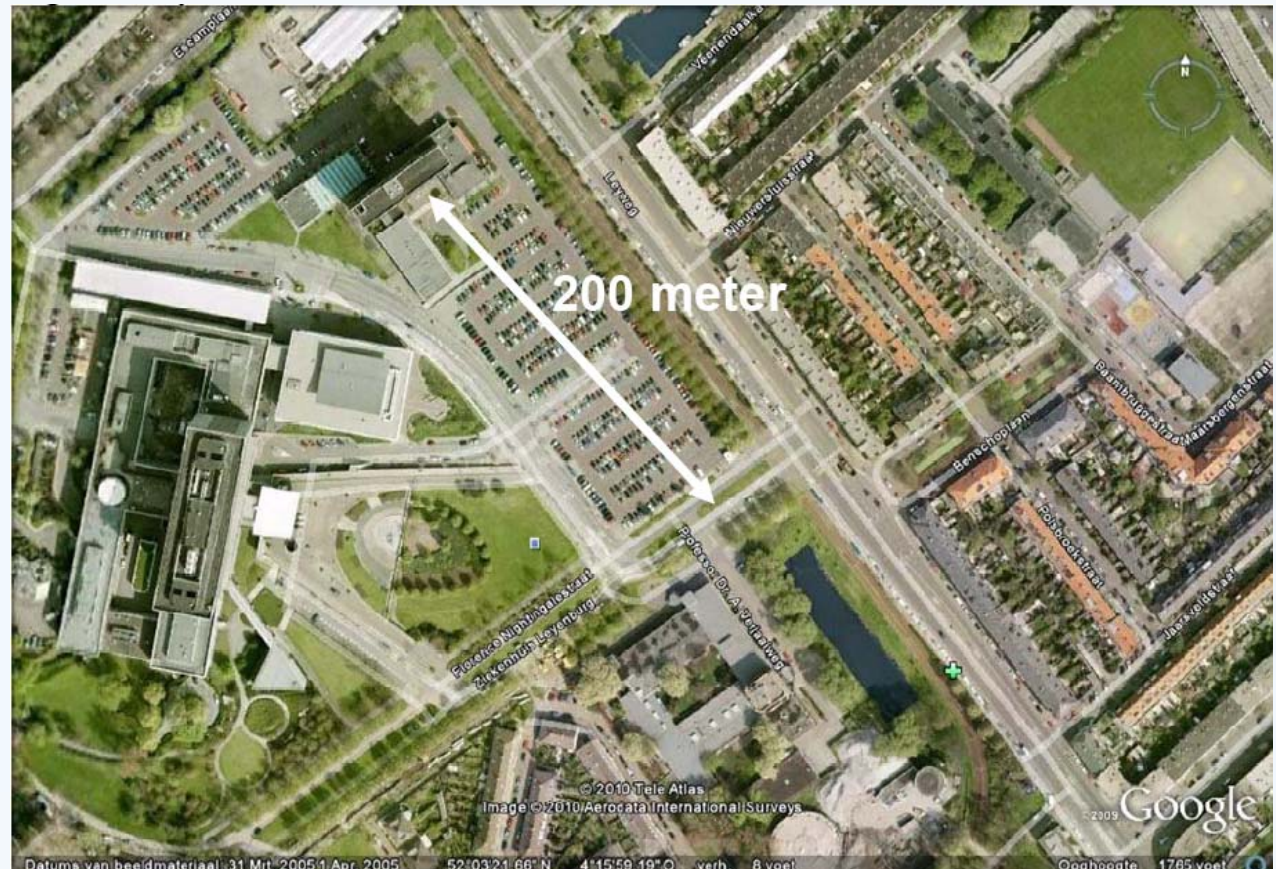
Urban drilling new?



Source: Google maps

Geothermal drilling in urban area

- Third biggest city in NL
- Hospital
- Trams
- Houses



Drilling in an urban area

Main topics

What are the main topics?



Drilling in an urban area

Location

- Location
 - Higher costs
 - Availability
 - Distance to neighbors
 - Dimensions
 - Soil contamination



Source: Google maps

Drilling in an urban area

Logistics

- Logistics
 - Coordination
 - Road infrastructure
 - Separate location
 - Well test
 - Municipality and public transport

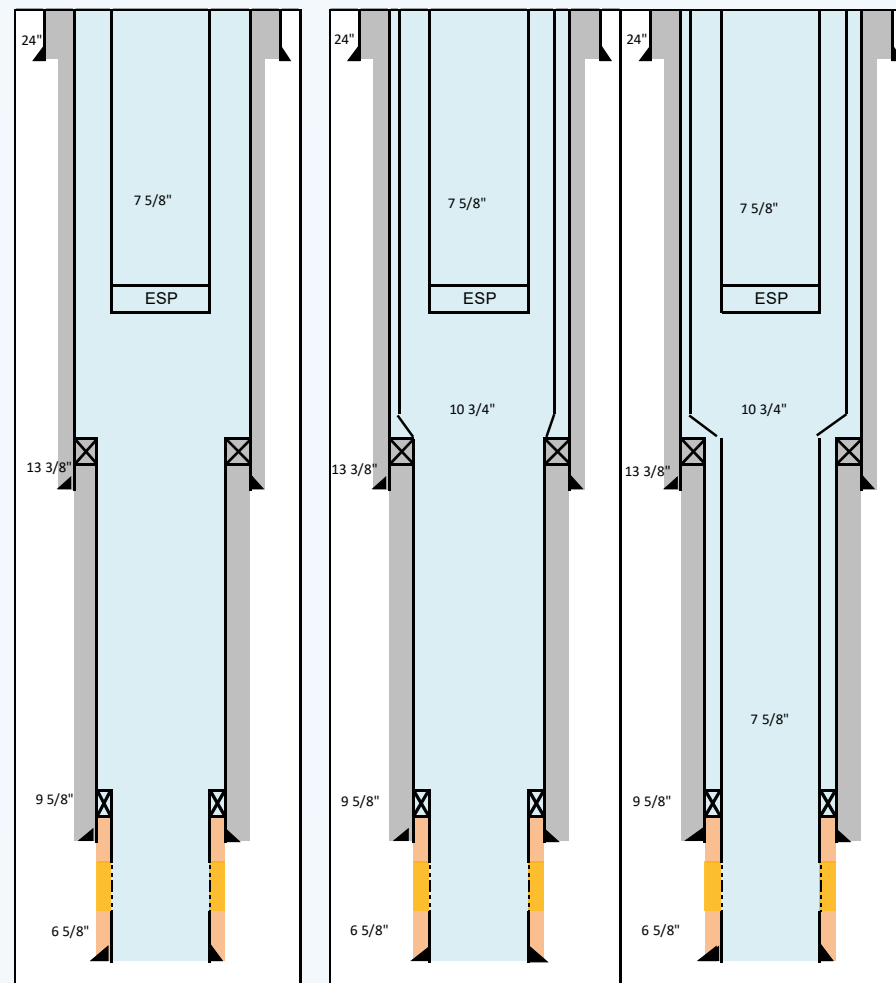


Drilling in an urban area

Well design

■ Well design

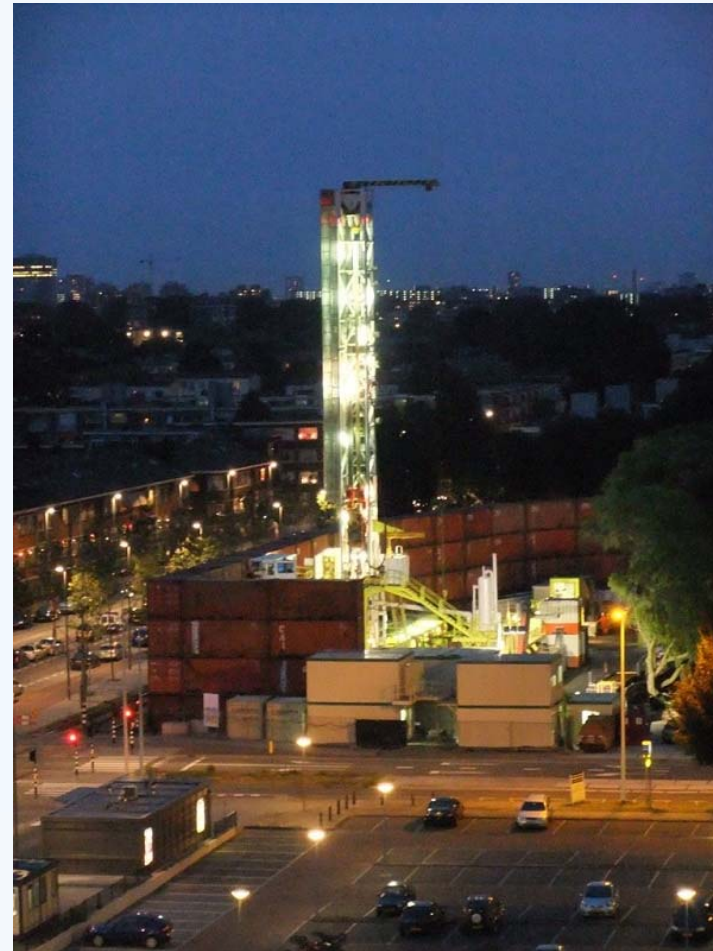
- Shallow gas
- Contingencies
- Surface casing
- Material casing
- Ground water
- Monitoring



Drilling in an urban area

Light emission

- Light emission
 - Drilling contractor
 - Type of lights
 - Awareness of crews



Drilling in an urban area

The Hague project

- Noise emission
 - Communication plan
 - Awareness program
 - Noise reduction measures

Noise emission

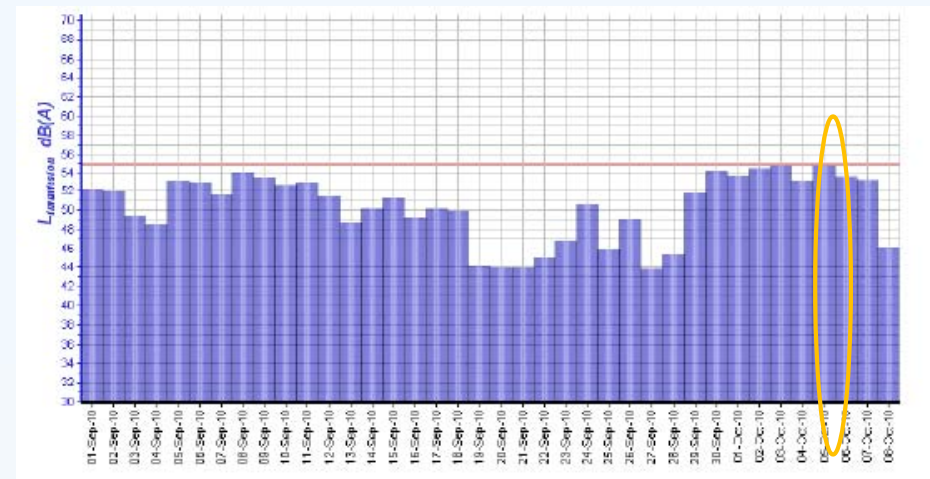
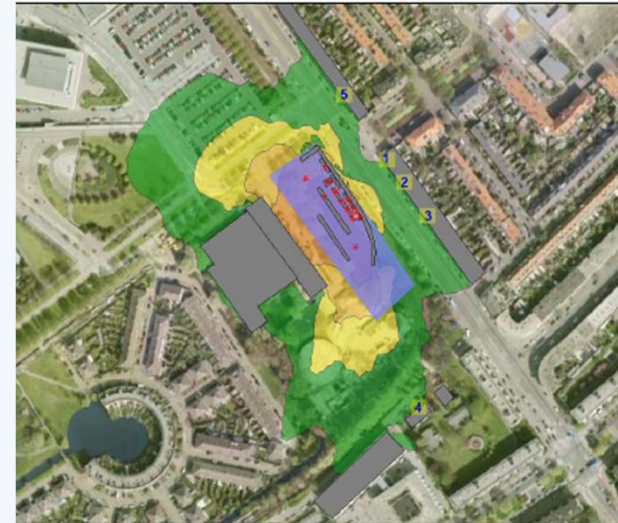


Drilling in an urban area

The Hague project

- Noise emission
 - Long term noise monitoring of rig
 - Modeling
 - Noise monitoring
 - Noise alarm system

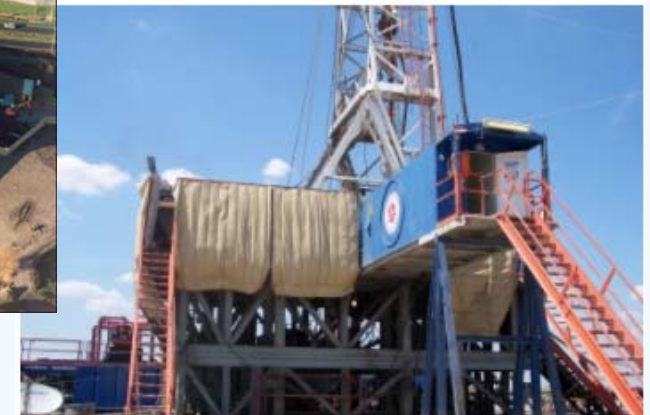
Noise emission



Drilling in an urban area

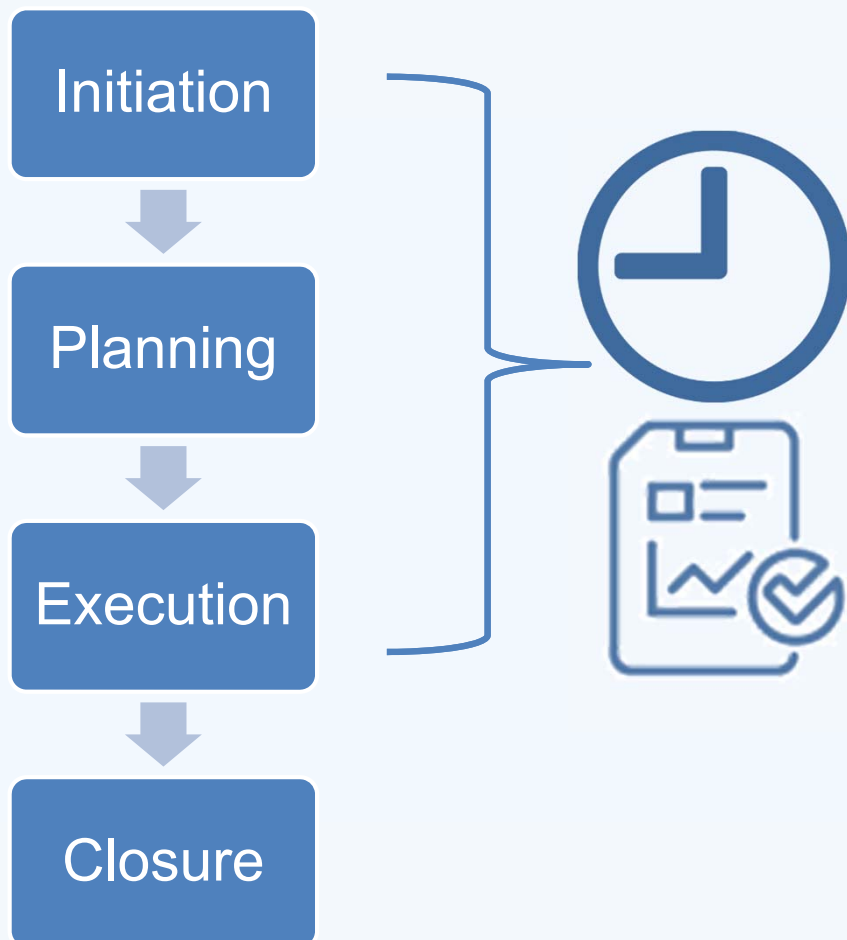
- Other measures
 - Mufflers
 - Radiator fan
 - Acoustical barriers
 - Encapsulating
 - Rubber mating
 - Forklift beeper

Noise emission



Drilling in an urban area

Successful project



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