GUIDELINEGEO

ABEM | MALÅ

CASE STORY

Bedrock and Aquifer mapping - South Sweden

| GPR |

Bedrock and aquifer mapping

Client

Vatten och Samhällsteknik AB (www.vosteknik.se) is a small consultant company in Southern Sweden, who work with investigations and planning for both geological, hydrogeological and environmental projects. They have a long experience of ground investigations and use the information from a number of different field investigation techniques to understand the subsurface in a non-destructive way.

Challenge

To increase the withdrawal of groundwater and place wells in the most efficient place, an esker area in Southern Sweden was investigated to get an estimation of the available aquifer volume. GPR was used to get a quick overview of the ground conditions and based on that information geotechnical drilling investigations were made to complete the investigation.

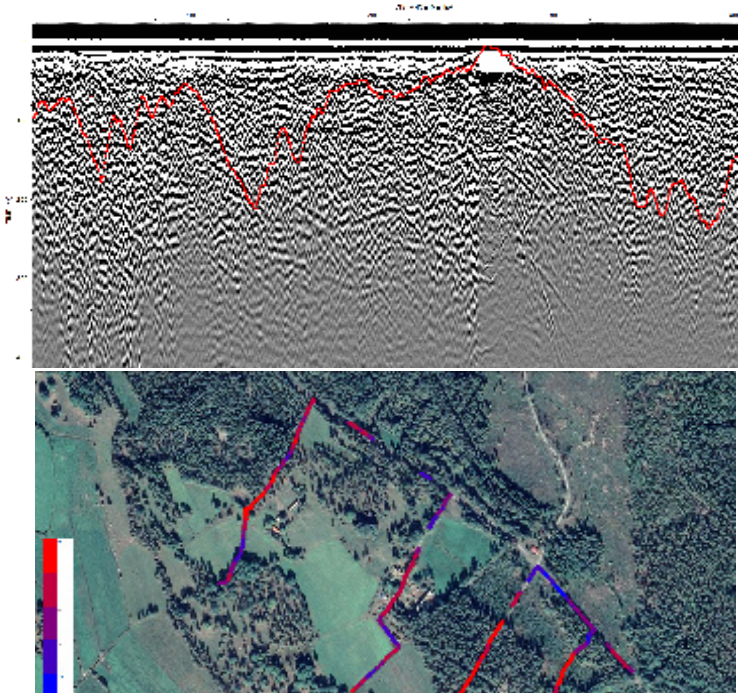
Solution

As it was estimated that the bedrock should be found rather deep, more than 10 meters, the GPR measurements were carried out with the MALÅ GX80 system, which in non-conductive conditions can reach 30-40 meters into the ground.

The field measurement was done with the pulling kit for easy work in forested terrain, but the antenna was also pulled behind a car along small gravel roads. The measurements were done with a 5 cm trace interval and a time window of 740 ns. Data acquisition was made with the GX controller, with support of the internal GPS. Markers were set when passing known points as crossings, corners etc to be used in the post-processing to correctly position the radar result. The data was interpreted in ReflexW and visualized with GPS Mapper and Google Earth for a quick way of showing an overview of the site conditions. The investigations comprised approximately 7700 meters and were carried out during 2 field days.

Result & Conclusion

The GPR investigation could give an initial, quick indication of the bedrock level in large parts of the investigated area. The results show rather undulating bedrock topography, reaching from 0 to 15 meters depth. The GPR results also pointed at a rather coarse-grained material on top of the bedrock and a few spots with clayey, silty material which should be avoided for groundwater withdrawal. The MALÅ GX80 system from Guideline Geo enabled a fast process, from data gathering to usable results, which gave a good foundation for further investigation planning.



The results were visualized in Google Earth in an easy colourscale showing the locations of shallow to deeper bedrock levels clearly.

PROJECT

- ▷ **Method:** Ground Penetrating Radar (GPR)
- ▷ **Solution:** MALÅ GroundExplorer (GX) 80 system
- ▷ **Measurement:** 5 cm trace interval and a time window of 740 ns
- ▷ **Inversion & Visualization SW:** ReflexW, GPS Mapper & Google Earth

Acknowledgement

We would like to thank *Vatten och Samhällsteknik AB* (www.vosteknik.se) for sharing this case.