

### 3.22 Description of the Skåne (SW and NE) case study, Sweden

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| Title of Case Study        | Skåne (SW, NE) |
| Location (region, Country) | Skåne          |
| Other information          |                |

#### Description of Case Study (background information on the region)

The southernmost part of Sweden, known as Scania, is one of the country's most densely populated regions. Scania relies on groundwater for 50% of its water supply, and groundwater is also extracted for agricultural and industrial purposes. Groundwater pressure is substantial, both in quantitative and qualitative terms. Groundwater contamination is a prevalent concern throughout the region and during more recent years, certain areas have repeatedly suffered from seasonal groundwater shortages. With predicted effects of climate change, negative water balances are likely to become more prevalent in both time and space.

Geologically and hydrogeologically, Scania is a heterogeneous and thus inherently complex though interesting region to study. The geological record is extensive, and the stratigraphy varies substantially within the region, often over relatively short distances. This is due to Scania's location, on a previously glaciated and once tectonically much active border region between Precambrian crystalline rocks of the Fennoscandian shield, and a range of sedimentary rocks typical to Phanerozoic Europe. Types of aquifers span fractured gneisses and sandstones, dual-porosity lime- and sandstones and a wealth of superficial to more or less buried glacial deposits. The total amount of delineated groundwater bodies within the region is just over 200, most of which equals porous sand-gravel aquifers.

#### Description of problem (why is this location chosen for a Cases Study)

Scania is one of few regions in Sweden where groundwater age assessments have been performed. This is likely due to the relatively high regional groundwater pressure and thus vulnerability, as well as the Geological Survey of Sweden's local presence. The hydrogeological heterogeneity has also spurred a general interest for tracer methodology testing in the area in general.

#### Methods to be used in the Case Study (analytical and isotope techniques, modelling)

The Skåne-pilot relies solely on previous studies and has not involved any novel sampling or analysis. The pilot, however, is the first compilation and joint assessment of existing data, albeit on a relatively simplified and general, conceptual scale.

Available data mainly involves sporadic, single, isolated tracer analyses in individual long-screened pumping wells. Tritium is the overall most common tracer applied though later work has also included CFCs, SF<sub>6</sub>, noble gases, <sup>3</sup>H-<sup>3</sup>He, <sup>39</sup>Ar and <sup>85</sup>Kr. <sup>14</sup>C-analyses are known from some areas.

#### Results from this Case Study

The amount of available tracer data from Skåne is relatively substantial. However, thorough analyses of age ranges and hydraulics within individual aquifers are scarce. Limitations include a lack of longer time-series, multi-tracer analyses and analyses from observation-wells. Regional groundwater management would benefit from more holistic and systematic analyses of existing and supplementary tracer data, including coupled tracer-modelling assessments of age ranges



and hydraulics, with the aid of (in places already existing) numerical hydrogeological models. Groundwater ages in aquifers in the region vary from <1 yr to >10 kyrs. At specific locations within Skåne, one may observe general trends and patterns in terms of groundwater age with e.g. depth. However, due to the general hydrogeological heterogeneity, patterns are oftentimes inherently difficult to deduce over some distance, both vertically and horizontally. Rather, on a regional scale and with regards to existing tracer data, it appears more suitable to discuss and infer GAR at a given location depending on the specific aquifer type in question, specifically with regards to porosity type (possibility for fissure flow or not) and level of confinement. E.g., surficial, unconfined porous aquifers are likely to exhibit relatively narrow groundwater age ranges spanning mainly recent decades, with a relatively young mean groundwater age. Deep, semi-confined aquifers with possibility for fissure flow may, at the other end of the scale, exhibit relatively wide groundwater age ranges spanning hundreds to thousands of years. While the mean groundwater age ought to be somewhat older, the most recent contributions might still be significantly young, i.e. <1 yr.

Overall, modern waters (< 60 yrs) appear considerably present down to standard depths for drinking water wells in most aquifer types throughout the region, indicating a large degree of regional vulnerability in terms of e.g. pollution risk. The only apparent exception in this regard - based on available data - appears to be narrow portions of deep, confined aquifers.

In terms of specific tracers, previous studies have shown that:

- SF<sub>6</sub>-concentrations throughout the region are among the highest ever reported and are interpreted to stem from natural sources. Accordingly, SF<sub>6</sub> does not appear a suitable groundwater tracer in the area. However, the region ought to be considered an interesting site for studies into natural SF<sub>6</sub>-sourcing.
- He-concentrations are generally high, suggesting Skåne is an interesting area for studies into the mechanisms and rates of radiogenic <sup>4</sup>He release in mixed young groundwater.
- Local contamination sources of CFC's appear regionally considerable.

#### Impact - how this Case Study contributes to the overall project aims

This case study contributes to:

- Establishing a European-wide harmonized database on groundwater age tracers and indicators.
- Identifying and describing important European aquifers with a significant amount of age indicators.
- Demonstrating the use (and limitations) of groundwater age tracer analyses with regards to characterisation and management of important European aquifers.

|                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |                                                          |                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------|
| <b>Name of pilot area / aquifers / type:</b><br>Skåne SW / Quaternary sand aquifers, Cretaceous limestone and crystalline bedrock aquifers / porous, dual-porosity and fissured |                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Country:</b> Sweden<br><br><b>Region:</b> Skåne          |                                                          |                                                   |
| <b>Study level</b>                                                                                                                                                              | Transboundary : <input type="checkbox"/> Regional: x      Local: <input type="checkbox"/> Single well(s): <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                   |                                                             |                                                          |                                                   |
| <b>Type of observations</b><br><i>(choose one of the options, create separate template if needed for each type if each type need specific information)</i>                      | <input type="checkbox"/> Short screened observation wells (not pumped)<br><input type="checkbox"/> Long screened observation wells (not pumped)<br><input checked="" type="checkbox"/> Pumped wells, long screens in one aquifer<br><input type="checkbox"/> Pumped wells, long screens over multiple aquifers<br><input type="checkbox"/> Springs<br><input type="checkbox"/> Other (eg. research wells; indicate type and information on pumping): |                                                             |                                                          |                                                   |
| <b>Approximate location of pilot:</b>                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |                                                          |                                                   |
| <b>Geological cross section / conceptual model of the pilot area:</b>                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |                                                          |                                                   |
| <b>Name of Shape- / Geopackage file defining the area:</b>                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Projection to be used:</b><br>WGS84 (Epsg4326)           |                                                          |                                                   |
| <b>Hydrological parameters:</b>                                                                                                                                                 | <b>Mean annual precipitation (mm or range in mm)</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Mean annual groundwater recharge (mm or range in mm)</b> | <b>Mean annual groundwater recharge temperature (°C)</b> | <b>Thickness of unsaturated zone (range in m)</b> |
|                                                                                                                                                                                 | 600-800                                                                                                                                                                                                                                                                                                                                                                                                                                              | 200-350                                                     | 8-9                                                      | 0-5 m                                             |
| <b>Pumped wells only</b>                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Typical pump discharge of</b> <b>Typical pump</b>        |                                                          |                                                   |



|                                                                                                                                                                                                                                                                                                                 |                                      |                                                                                                                                                                                               |                                              |                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                 |                                      | sampled individual well<br>(m <sup>3</sup> /day): 1-1000                                                                                                                                      |                                              | discharge of<br>complete well field<br>(m <sup>3</sup> /day): -<br><i>If relevant</i> |
| List of aquifers and aquitards in pilot<br>area*<br><i>*Given no:s = along cross section &lt; within full pilot area</i>                                                                                                                                                                                        |                                      | No. of confined or<br>semiconfined aquifers in pilot<br>area: 3                                                                                                                               |                                              | No. of unconfined<br>aquifers in pilot area:<br>2                                     |
| Aquifer no. (aqf): 5<br>Aquitard<br>(aqt/acl): 2                                                                                                                                                                                                                                                                | Aquifer/aquitard<br>type and/or name | Lithology<br>(Resource WP6<br>terminology)                                                                                                                                                    | Depth range<br>(m)                           | GW age range (yr)                                                                     |
| Aqf-1:                                                                                                                                                                                                                                                                                                          | Glaciofluvial<br>deposits            | Fine sand to<br>gravel                                                                                                                                                                        | 0-30                                         | <5 - >60                                                                              |
| Porosity type                                                                                                                                                                                                                                                                                                   | Porous: X                            | Fissured: <input type="checkbox"/>                                                                                                                                                            | Karst: <input type="checkbox"/>              | Fissured and porous /<br>dual porosity: <input type="checkbox"/>                      |
| Aqt/acl -1:                                                                                                                                                                                                                                                                                                     | Glacial till/clay-silt               | Clay-silt,<br>clayey-clay till                                                                                                                                                                |                                              |                                                                                       |
| Porosity type                                                                                                                                                                                                                                                                                                   | Porous: <input type="checkbox"/>     | Fissured: <input type="checkbox"/>                                                                                                                                                            | Fissured and<br>porous / dual<br>porosity: X | No hydraulically<br>active porosity: X                                                |
| Aqf-2:                                                                                                                                                                                                                                                                                                          | Glaciofluvial<br>deposits            | Fine sand to<br>gravel                                                                                                                                                                        | 10-40                                        | <5 - >60                                                                              |
| Porosity type                                                                                                                                                                                                                                                                                                   | Porous: X                            | Fissured: <input type="checkbox"/>                                                                                                                                                            | Karst: <input type="checkbox"/>              | Fissured and porous /<br>dual porosity: <input type="checkbox"/>                      |
| Aqt/acl -2:                                                                                                                                                                                                                                                                                                     | Glacial till/clay-silt               | Clay-silt,<br>clayey-clay till                                                                                                                                                                |                                              |                                                                                       |
| Porosity type                                                                                                                                                                                                                                                                                                   | Porous: <input type="checkbox"/>     | Fissured: <input type="checkbox"/>                                                                                                                                                            | Fissured and<br>porous / dual<br>porosity: X | No hydraulically<br>active porosity: X                                                |
| Aqf-3:                                                                                                                                                                                                                                                                                                          | Glaciofluvial<br>deposits            | Coarse sand to<br>gravel                                                                                                                                                                      | 40-80                                        | >50 - >2 000                                                                          |
| Porosity type                                                                                                                                                                                                                                                                                                   | Porous: X                            | Fissured: <input type="checkbox"/>                                                                                                                                                            | Karst: <input type="checkbox"/>              | Fissured and porous /<br>dual porosity: <input type="checkbox"/>                      |
| Aqf-4:                                                                                                                                                                                                                                                                                                          | Danian limestone                     | Limestone                                                                                                                                                                                     | 5->80                                        | <60 - >10 000                                                                         |
| Porosity type                                                                                                                                                                                                                                                                                                   | Porous: <input type="checkbox"/>     | Fissured: <input type="checkbox"/>                                                                                                                                                            | Karst: <input type="checkbox"/>              | Fissured and porous /<br>dual porosity: X                                             |
| Aqf-5                                                                                                                                                                                                                                                                                                           | Crystalline<br>basement              | Granite, gneiss                                                                                                                                                                               | 0-                                           | <1 - >100                                                                             |
| Porosity type                                                                                                                                                                                                                                                                                                   | Porous: <input type="checkbox"/>     | Fissured: X                                                                                                                                                                                   | Karst: <input type="checkbox"/>              | Fissured and porous /<br>dual porosity: <input type="checkbox"/>                      |
| Applied tracer age indicators ( <sup>3</sup> H,<br><sup>3</sup> H/ <sup>3</sup> He, <sup>85</sup> Kr, <sup>39</sup> Ar, <sup>14</sup> C, <sup>36</sup> Cl, <sup>81</sup> Kr, <sup>4</sup> He,<br>CFCs, SF <sub>6</sub> , etc.)<br>Applied recharge temperature<br>indicators ( <sup>18</sup> O, D, noble gases) |                                      | Aquifer-1<br><sup>3</sup> H, <sup>3</sup> H/ <sup>3</sup> He, <sup>4</sup> He, CFC, SF <sub>6</sub> , noble gases                                                                             |                                              |                                                                                       |
|                                                                                                                                                                                                                                                                                                                 |                                      | Aquifer-2<br><sup>3</sup> H, <sup>3</sup> H/ <sup>3</sup> He, <sup>4</sup> He, CFC, SF <sub>6</sub> , noble gases                                                                             |                                              |                                                                                       |
|                                                                                                                                                                                                                                                                                                                 |                                      | Aquifer-3<br><sup>3</sup> H, <sup>3</sup> H/ <sup>3</sup> He, <sup>4</sup> He, CFC, SF <sub>6</sub> , noble gases, <sup>14</sup> C, <sup>39</sup> Ar, <sup>85</sup> Kr, <sup>18</sup> O,<br>D |                                              |                                                                                       |



|                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                   | <b>Aquifer-4</b><br>$^3\text{H}$ , $^{14}\text{C}$ , $^{18}\text{O}$ , D                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                   | <b>Aquifer-5</b><br>$^3\text{H}$ , $^3\text{H}/^3\text{He}$ , $^4\text{He}$ , CFC, $\text{SF}_6$ , noble gases                                                                                                                                                                                                                                                                                                                                                         |
| Number of sites (wells/springs) with age indicators                                                               | <b>Aquifer-1</b><br>1-5: <input type="checkbox"/> 5-10: X* 10-25: <input type="checkbox"/> >25: <input type="checkbox"/><br><i>*Total no. of samples from similar type-aquifers within the greater pilot area</i>                                                                                                                                                                                                                                                      |
|                                                                                                                   | <b>Aquifer-2</b><br>1-5: X* 5-10: <input type="checkbox"/> 10-25: <input type="checkbox"/> >25: <input type="checkbox"/><br><i>*Total no. of samples from similar type-aquifers within the greater pilot area</i>                                                                                                                                                                                                                                                      |
|                                                                                                                   | <b>Aquifer-3</b><br>1-5: <input type="checkbox"/> 5-10: <input type="checkbox"/> 10-25: X >25: <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                   | <b>Aquifer-4</b><br>1-5: <input type="checkbox"/> 5-10: <input type="checkbox"/> 10-25: <input type="checkbox"/> >25: X                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                   | <b>Aquifer-5</b><br>1-5: X* 5-10: <input type="checkbox"/> 10-25: <input type="checkbox"/> >25: <input type="checkbox"/> - None<br><i>*Samples from similar type-aquifer in NW Skåne</i>                                                                                                                                                                                                                                                                               |
| GW age range (GAR)<br>GAR-1: Modern (< 60 yr)<br>GAR-2: Old (> 60 yr and 10 kyr)<br>GAR-3: Paleowaters (> 10 kyr) | <b>Aquifer-1*</b><br>GAR-1: 1-10%: <input type="checkbox"/> 10-25%: <input type="checkbox"/> 25-50%: <input type="checkbox"/> >50%: X<br>GAR-2: 1-10%: X 10-25%: <input type="checkbox"/> 25-50%: <input type="checkbox"/> >50%: <input type="checkbox"/><br>GAR-3: 1-10%: <input type="checkbox"/> 10-25%: <input type="checkbox"/> 25-50%: <input type="checkbox"/> >50%: <input type="checkbox"/><br><i>*GAR extrapolated from similar aquifer-type in NE Skåne</i> |
|                                                                                                                   | <b>Aquifer-2*</b><br>GAR-1: 1-10%: <input type="checkbox"/> 10-25%: <input type="checkbox"/> 25-50%: <input type="checkbox"/> >50%: X<br>GAR-2: 1-10%: <input type="checkbox"/> 10-25%: X 25-50%: <input type="checkbox"/> >50%: <input type="checkbox"/><br>GAR-3: 1-10%: <input type="checkbox"/> 10-25%: <input type="checkbox"/> 25-50%: <input type="checkbox"/> >50%: <input type="checkbox"/><br><i>*GAR extrapolated from similar aquifer-type in NW Skåne</i> |
|                                                                                                                   | <b>Aquifer-3</b><br>GAR-1: 1-10%: X 10-25%: <input type="checkbox"/> 25-50%: <input type="checkbox"/> >50%: <input type="checkbox"/><br>GAR-2: 1-10%: <input type="checkbox"/> 10-25%: <input type="checkbox"/> 25-50%: <input type="checkbox"/> >50%: X<br>GAR-3: 1-10%: <input type="checkbox"/> 10-25%: <input type="checkbox"/> 25-50%: <input type="checkbox"/> >50%: <input type="checkbox"/>                                                                    |
|                                                                                                                   | <b>Aquifer-4</b><br>GAR-1: 1-10%: <input type="checkbox"/> 10-25%: <input type="checkbox"/> 25-50%: X >50%: <input type="checkbox"/><br>GAR-2: 1-10%: <input type="checkbox"/> 10-25%: <input type="checkbox"/> 25-50%: X >50%: <input type="checkbox"/><br>GAR-3: 1-10%: X 10-25%: <input type="checkbox"/> 25-50%: <input type="checkbox"/> >50%: <input type="checkbox"/>                                                                                           |
|                                                                                                                   | <b>Aquifer-5*</b><br>GAR-1: 1-10%: <input type="checkbox"/> 10-25%: <input type="checkbox"/> 25-50%: <input type="checkbox"/> >50%: X<br>GAR-2: 1-10%: <input type="checkbox"/> 10-25%: X 25-50%: <input type="checkbox"/> >50%: <input type="checkbox"/><br>GAR-3: 1-10%: <input type="checkbox"/> 10-25%: <input type="checkbox"/> 25-50%: <input type="checkbox"/> >50%: <input type="checkbox"/><br><i>*Extrapolated from similar aquifer-type in NW Skåne</i>     |
|                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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|                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Groundwater age ranges (GAR) estimated by:                                                                        | Tracer based estimates X<br>Flow and age model simulations <input type="checkbox"/><br>Combination of model and tracer estimates <input type="checkbox"/><br>Expert judgement: X                                                                                                                                                                                                                                                                                       |
| Objective of age dating studies:                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Basic research or General groundwater management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Assessment of pollutant history |            | Assessment of the efficiency of remediation and mitigation measures                                                                                                                                                                                                                                                                  |          | Indication of vulnerability of aquifers and water supply wells |                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------|-------------------------|
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                 |            |                                                                                                                                                                                                                                                                                                                                      |          | X                                                              |                         |
| Water Usage<br><i>(not relevant for observation wells)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Water supply                    |            | Irrigation                                                                                                                                                                                                                                                                                                                           | Industry | Other                                                          |                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | X                               |            | X                                                                                                                                                                                                                                                                                                                                    | X        |                                                                |                         |
| Geoenergy related activities<br><i>(not relevant for observation wells)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Shallow Geo-T                   | Deep Geo-T | Hydrocarbons                                                                                                                                                                                                                                                                                                                         |          | Nuclear waste disp.                                            | CO <sub>2</sub> storage |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | X                               |            |                                                                                                                                                                                                                                                                                                                                      |          |                                                                |                         |
| Mining activities<br><i>(not relevant for observation wells)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Construction materials          |            | Minerals / metals                                                                                                                                                                                                                                                                                                                    | Coal     | Other                                                          |                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | X                               |            |                                                                                                                                                                                                                                                                                                                                      |          |                                                                |                         |
| REFERENCES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                 |            |                                                                                                                                                                                                                                                                                                                                      |          |                                                                |                         |
| <b>OPEN Access reports and papers</b> (PDF versions made available in EGD repository making them downloadable via maps and keyword / free text searches):<br><br><b>Barmen G., 1992.</b> On the combination of isotope hydrogeology with regional flow and transport modelling. PhD-thesis. Department of Engineering Geology, Lund Institute of Technology, Lund University.<br><b>Gustafsson O., 1972.</b> Beskrivning till hydrogeologiska kartbladet Trelleborg NV och Malmö SV. SGU-Ser. Ag 4. Sveriges geologiska undersökning/Geological Survey of Sweden.<br><b>Gustafsson O., 1978.</b> Beskrivning till hydrogeologiska kartbladet Trelleborg NO/Malmö SO. SGU-Ser. Ag 6. Sveriges geologiska undersökning/Geological Survey of Sweden.<br><b>Gustafsson O., 1981.</b> Beskrivning till hydrogeologiska kartbladet Malmö NV. SGU-Ser. Ag 14. Sveriges geologiska undersökning/Geological Survey of Sweden.<br><b>Åkesson M., 2014.</b> On the scope and assessment of pesticides in groundwater in Skåne, Sweden. LUNDQUA Thesis 74. Quaternary Sciences, Department of Geology, Lund University. |                                 |            | <b>Reports and papers with restricted access:</b><br><br><b>Åkesson M., Suckow A., Visser A., Sültenfuss J., Laier T., Purtschert R. and Sparrenbom C.J., 2015.</b> Constraining age distributions of groundwater from public supply wells in diverse hydrogeological settings in Scania, Sweden. Journal of Hydrology 582: 217-229. |          |                                                                |                         |

**Remarks / other relevant information:**

This case study is meant to exemplify the geological and hydrogeological heterogeneity of SW Skåne, and the resulting GAR diversity. The conceptual model is, obviously, a simplification but meant to visualise general stratigraphy and aquifer types within the region. Please note that no hydrogeological unit is spatially continuous along the profile/over the region, which is also the reason for why aquitards/aquicludes are not specified as either or – the exact lithology and hydraulic function varies depending on location. Also, within the entire region, there are really several AQF-1's and AQF-2's. AQF-3 and -4 are likely hydraulically connected.

The provided information on age range is partly based on site-specific data (AQF-3, AQF-4) and partly on data from other parts of Skåne, from similar aquifer types (AQF-1, AQF-2, AQF-6).

Note that tracer data and thus GAR-estimates ought to be regarded as maximally representative down to standard depths of drinking water wells (here max c. 100 m).