

Using soil material identification to deconstruct coalbed methane water storage ponds and rehabilitate pasture land

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land and water stewardship

BeneTerra

- Based in Wyoming USA and Queensland Australia
- Disturbed land rehabilitation
- Wastewater treatment and re-use



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Glenn Bailey

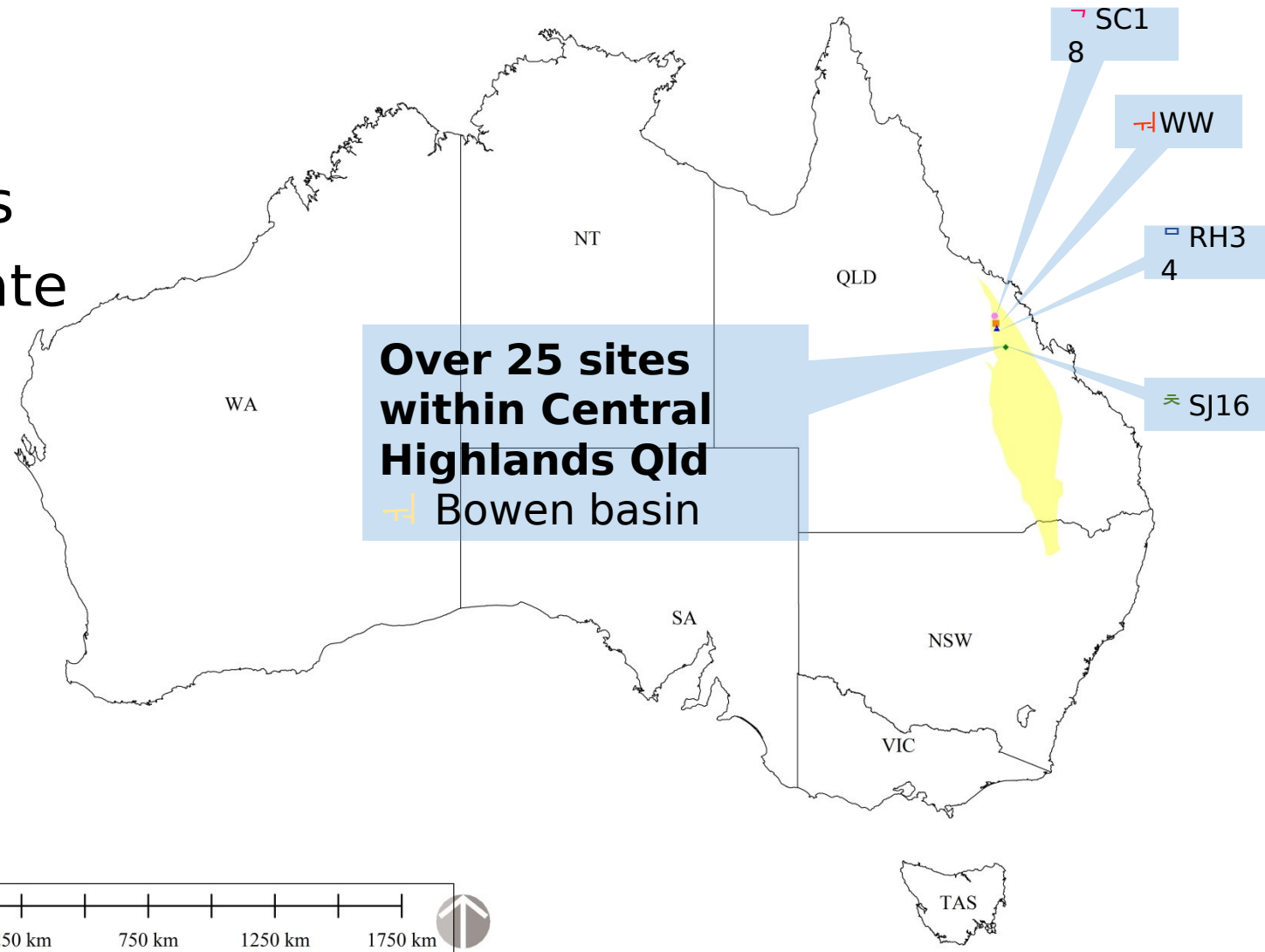
- Formed more than 40 years ago
- Australian
- Trained in Forestry
- Worked in soil science since 2004
- Focus on pedology and soil constraints



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Coalbed Methane in Australia

- CBM (Coal Seam Gas- CSG in Australia)
- Exploration and appraisal wells
- Legal requirement to rehabilitate
- Water storage dams
- Remote sites, small scale, isolated
- 600 mm rainfall, summer dominant
- Hot summers, mild winters



Problem Statement

Hundreds of holding ponds were built without regard for soil quality and haphazard placement of materials has led to placement of poor quality materials near surface



Earthen water storage dams

- “Turkey’s nest” design
 - Soil for walls pushed up from dam cavity
- Usually lined with plastic, sometimes dry
- Thirty-six sites rehabilitated to date



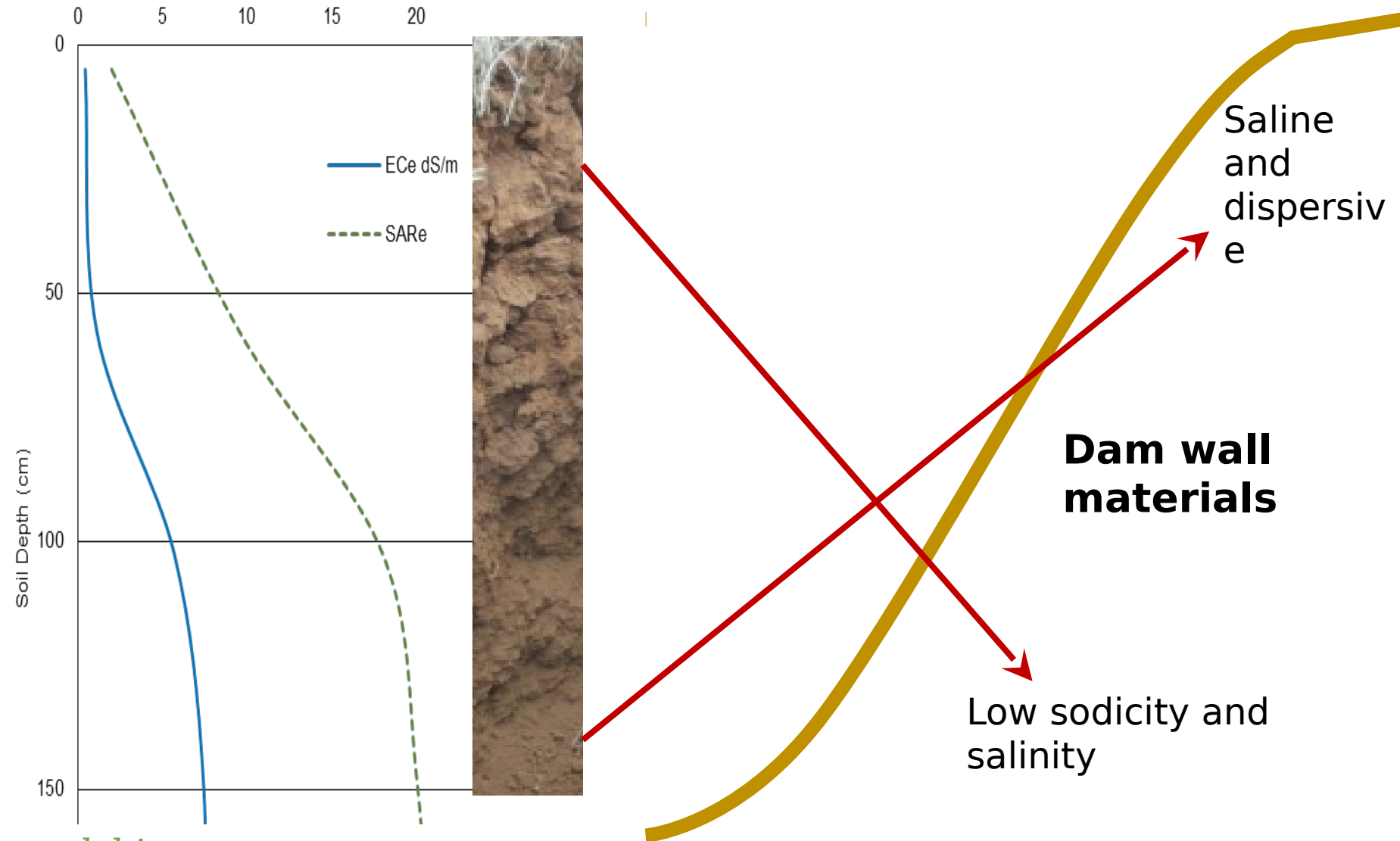
Assessing the dam walls

- Some dam banks appear more favourable than others

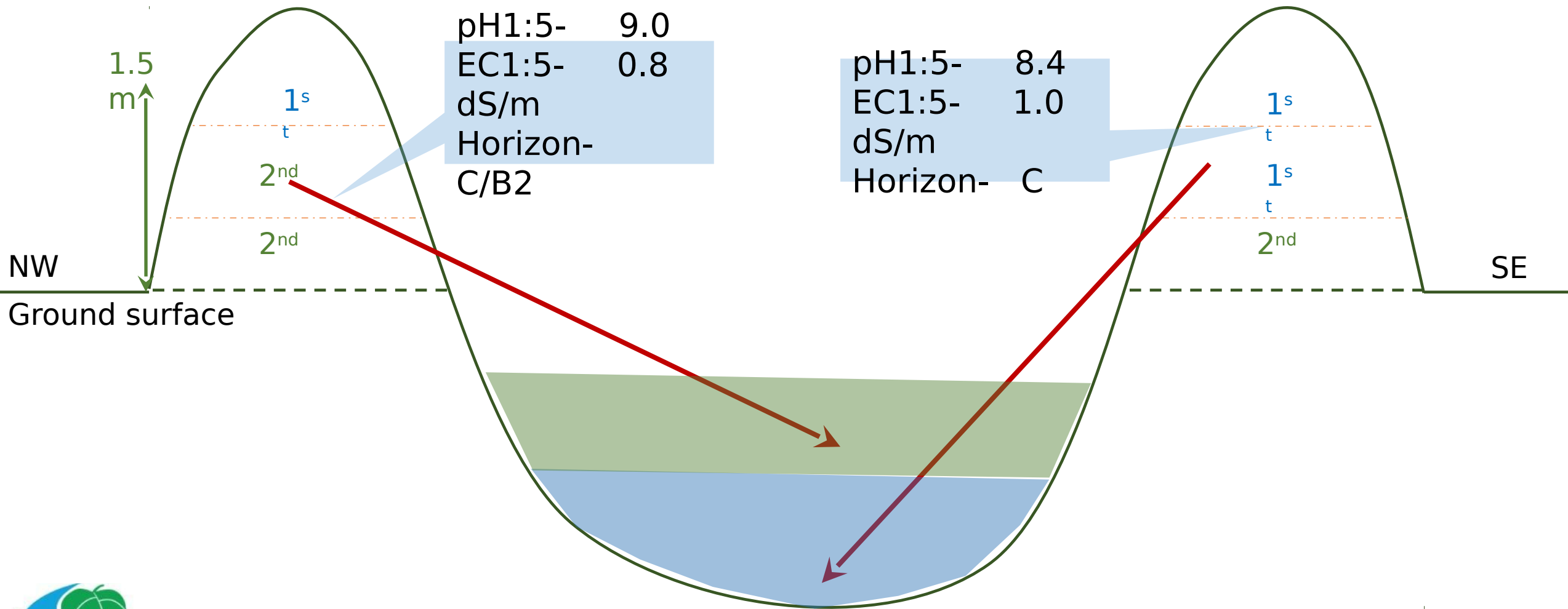


From the soil profile to the dam walls

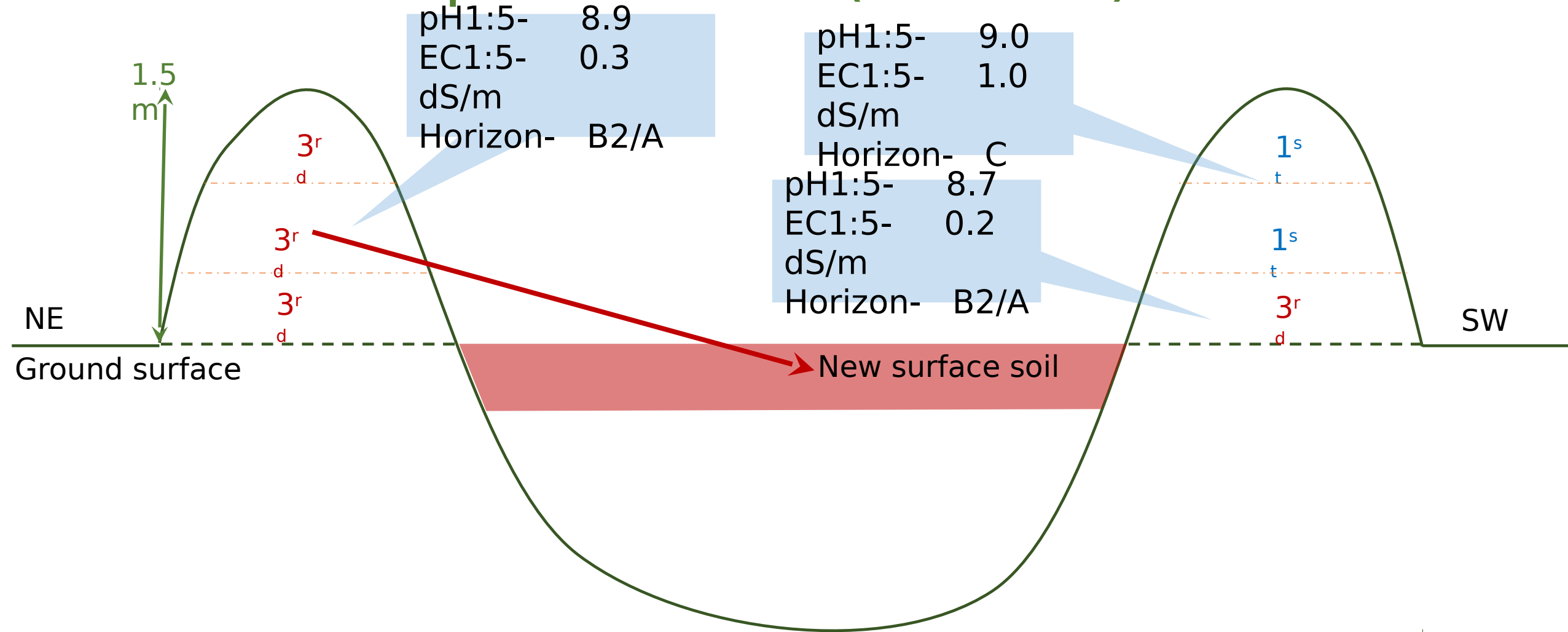
- The native soil is generally best at the surface and grades to poorer qualities- often sodic
- This is inverted in the dam wall construction
- E.g. uniform brown cracking clay (SC18-Vertisol)



The example of SC18 (Vertisol)



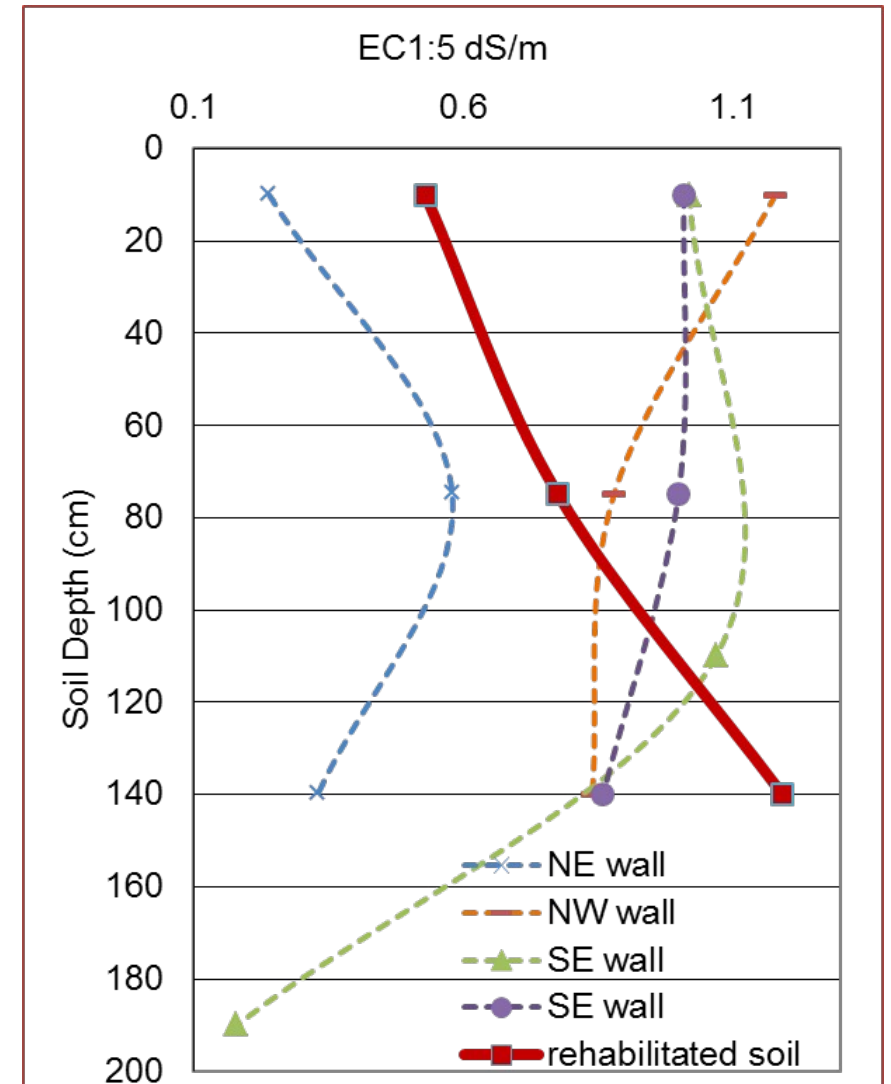
The example of SC18 (Vertisol)





The example of SC18 (Vertisol)

- Gradation in salinity from surface
- Usually not focused on just one factor:
 - pH
 - Original horizon position
 - Dispersion/sodicity
 - Morphological features (texture, colour, structure)
 - Calcite, gravel, stone
- Aim for most favourable combination at the surface
- N and P fertiliser and gypsum applied to surface





Nov
2013



May
2015



June
2015



Nov
2014



Dec
2014



June
2015

BeneTerra

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