

What's in the soil?

Topic: Mining and Rehabilitation

Background Information:

Soil consists of different layers. When preparing an area for mining, the soil is removed from the caprock in three stages:

The **topsoil** layer contains a large store of seed, good bacteria, and organic matter (nutrients) that is vital to the success of the forest rehabilitation. Scrapers remove the topsoil and where available direct return to adjacent areas that have been mined and landscaped. **Direct return** is preferable as the soil is fresh and this ensures that the elements of the topsoil are maintained and transferred directly to the new area. If an adjacent area is not ready for direct return then the soil has to be **stockpiled**. This can affect the diversity of the rehab as the seeds may rot in the stockpile – however stockpiling for a short period over summer has a less pronounced effect.

Once the topsoil layer is removed then scrapers remove the **overburden** for stockpiling. The overburden is a gravely sub-soil material approximately 20-80cm thick. **SOBR- secondary overburden removal**. The caprock beneath the overburden is not smooth; it has pockets and holes like a moonscape. Gravely material collects in these and so a secondary overburden removal is done by excavator. The excavators scoop this out and pile it up for scrapers to stockpile it.

Dieback affected and dieback free soils are kept separate.

You will need:

- Different samples of soil from different locations (include sandy soils/loamy soils/ soil from school garden/ soil from home / leaf litter)
- Magnifying glass
- Beaker/Petri dishes to place different materials in
- Tweezers
- Colander holes or slots.

What you need to do

- Use the colander to sieve the different soils separately
- Analyse the soil samples collected and remove any matter for further examination. Determine the materials that make up the different layers
- Graph the results.

Extension/Alternatives

- Determine the best way to propagate the seeds that are removed from the topsoil. Some plant seeds require additional intervention such as heating in order to germinate. Which seeds germinate without assistance?

This activity is based on a similar activity relating to Jarrah Dieback, developed by the Armadale Primary School in Western Australia. For alternative activities relating to dieback in the Jarrah Forest refer <http://www.dwg.org.au/>

Curriculum Links:

Society & Environment: Investigation, Communication & Participation, Place and Space, Resources, Active Citizenship - Ecological Sustainability

Science: Life and Living, Earth and Beyond

Mathematics: Chance and Data

Values

Environmental Responsibility

Links:

www.alcoa.com.au

<http://www.dwg.org.au/>