

Site and Soil Assessment

The field component of the Land Capability Assessment (LCA) for the design of an on-site wastewater system is to identify the proposed wastewater land application area (LAA). After allowing for structures such as house, shed, out-buildings and gardens, consider adequate buffers to boundaries, farm dams, creeks and environmentally sensitive areas. Identify an area that will minimise run-on impacts and reduce on-site constraints.

Where to take soil samples?

Assess whether the surface features in the proposed LAA indicate a similar soil over the area or whether there may be several different soil types. Usually soil colour and plant species (and density) will give some indication. A sample of the representative soil profile is needed.

Who takes the sample?

It is important that the person who takes the sample follows some basic rules of soil sampling and can replicate the sampling procedure at a later date. For a single allotment, at least two inspection holes are required, sometimes more, although only one site may be sampled for analysis.

What equipment is needed?

- soil auger, shovel or backhoe
- tape measure
- clean plastic sheet
- unused plastic bags and elastic bands
- masking tape and permanent marker



Please do not write on plastic bags with felt markers, the writing will rub off in-transit. Place a strip of masking tape on the bag and write on the tape, or use a label tie.

Each soil sample should have a unique identifier - site and horizon, such as "site 1, horizon 1", or "1/1"

Other details you will need to keep for your records are:
date soil samples taken, date dispatched
location of excavation (GPS or map location)
other details on each soil sample - depth, stoniness, moisture, groundwater

Complete the details overleaf and send with your samples and payment to Lanfax Labs.

Lanfax Laboratories

Independence

Lanfax Labs - an independent, commercial and research organisation with special interests in soil, water and wastewater analysis, effluent and greywater management.

Quality Management Systems

Lanfax Labs successfully participates in a range of proficiency testing programs at the National level to ensure quality assurance using recognised methods and standard procedures for soil, water and plant analysis. All tests are performed according to approved methods and proficiency testing programs.

Water Quality Analysis

Lanfax Labs provide a range of tests and assessments to Universities, Government Agencies, Local Authorities, commercial operators and individuals for:

- Drinking water, irrigation and stock water
- Groundwater impact assessment
- Wastewater reuse and recycling
- Greywater and stormwater management
- Domestic effluent and urban sewage
- Surface and river water monitoring
- Liquid Trade Waste
- Laundry detergent assessments

Soil Physical and Chemical Properties

Lanfax Labs provide soil sample analysis for:
Agricultural, pastoral & horticultural use
Wastewater application - commercial and domestic
Manure and biosolids application to land
Land reclamation and subdivisions
Salinity and Sodicity

On-site Effluent Disposal

Lanfax Labs can provide domestic on-site wastewater system design to meet Local Government regulations.

Laundry Product Research & Greywater Reuse

Lanfax Labs has researched phosphorus and salinity components of laundry detergents. This information is published on our website or available from the lab at no charge.



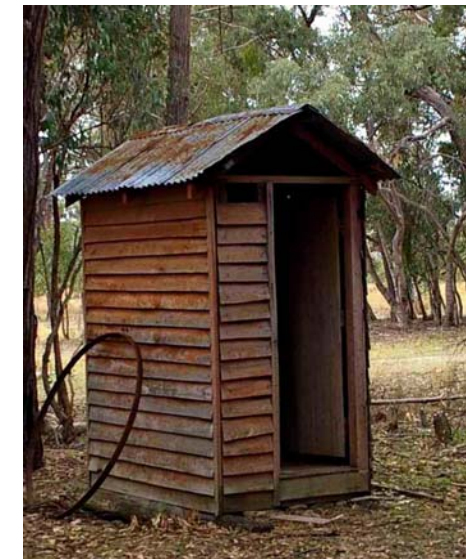
ABN 72 212 385 096

www.lanfaxlabs.com.au

Soil and Water Resource Consultants

Proficiency tested with ASPAC

Soil Analysis for On-site Wastewater Systems



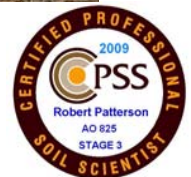
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Taking the sample

Figure 1 shows the soil excavated with a soil auger, laid out to show the various horizons. Be careful that you lay out the soil to reflect approximately the depth from which it came.



Figure 1. Layout of soil from auger hole

The top horizon is dark from organic material and decomposing vegetation. Often this horizon will be bound together by plant roots.

The second horizon will mostly be paler than surface, but may also be very pale compared with either the top or third horizon.

The third horizon is often the most clayey, and its colour may vary from red, to yellow to grey in soils developed on sediments or granites.

In heavy basalt soils, such as in flow lines, the soil may look reasonably uniform in all horizons. In this case simply sample from the top 200 mm, and then take a sample from about 600 mm deep to give just two samples per profile.

When you have excavated the profile (as shown above), identify the horizons based on colour or some distinguishing feature. In many areas, there will be three horizons within the first 1.0 m depth.

Take a sample of soil from each horizon. Discard any stones, rocks or plant material. Place a good double-handful of soil in a new plastic bag. Label the bag on the outside by writing on masking tape with a unique number that you record against the horizon (1st, 2nd, 3rd). DO NOT write on the plastic with a marker, as the writing may rub off or smear and the identity of the sample will be lost.

Keep bagged samples out of the sun (reduces sweating of sample), and send samples to **Lanfax Labs** as soon as you can.

Sample collection

Keep these details for your records - do not send to lab.

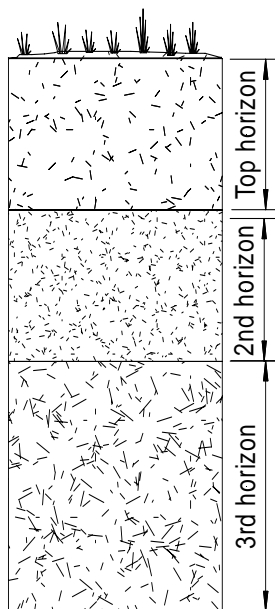


Figure 2 Typical profile

Measure and record the depth of each horizon. Draw yourself a simple diagram to show the various horizons and their depths as shown in Figure 2.

Record depth from surface to the change in each horizon.

Record other distinguishing features, such as mottling against each horizon.

Describe any gravel, stones by proportion of soil mix.

Record any water that enters the hole (usually wait about 20 min before making this assessment).

Take a photograph of the soil profile (as set out in Figure 1). Make labels and show some scale.

Table 1. Tests carried out on the three horizons

Horizon	Tests
1, 2 & 3	pH (water), pH (CaCl ₂), EC, salinity, exchangeable cations (Na ⁺ , K ⁺ , Ca ²⁺ , Mg ²⁺ , H ⁺ & Al ³⁺), ESP, CEC, Ca/Mg ratio, soil colour, soil texture, aggregate stability
3	5-point Phosphorus sorption rating

For the tests required for On-site Wastewater Assessment, samples can be up to a week old. Longer than this, the samples need to be air-dried and will then keep for months.

Tie off the top of the bag and check that label shows:
 unique sample number
 location (optional)
 date sample taken

Complete details and submit with sample

Name

Contact Phone No.

Email for sample results

Business Name

Address

Town Post code

Date sample taken

Number of samples submitted.....

Special conditions (please state)

Check that each sample has a unique number, and you have recorded the location of that sample in your records.

Note: Each set of samples consists of three soil samples, one from each horizon down the profile.

Results will be forwarded by email in a form that may be appended to your report. If only two horizons are included, the phosphorus sorption test will be done on the lower horizon.

Australia Post provides an efficient service by either Express or ordinary mail. Armidale is outside the Express Delivery, even though you pay for it. Please address to Lanfax Labs PO Box 4690 Armidale 2350. Do not use our street address.

Turn-around time is usually 10 days from receipt of soils.

Cost: Each set of three samples costs \$250 including GST.
Prices apply from January 2010