

Assessing the soil in children's services – guidelines for environmental consultants

Fact Sheet | March 2011

Why is soil assessment required?

The Department of Education and Training (the Department) requires an assessment of soil at a site proposed for use as a children's service, and in some cases, sites already in use as children's services. Soil assessment is part of process of considering whether the proposed location of the children's service is considered satisfactory for that purpose under section 10 of the *Children's Services Act 1996* (Act). It provides confirmation that the soil does not contain substances at levels that are harmful to human health and that the soil has no offensive odour.

These Guidelines set out the information required for soil assessment, particularly assessing whether there are substances in the soil that pose a human health risk and if there is potential for impacts to the site from off-site sources.

An environmental consulting firm (environmental consultant) experienced in assessment of land contamination should undertake the soil assessment in accordance with the following policies and standards:

- National Environment Protection (Assessment of Site Contamination) Measure 1999 Measure (NEPM) and relevant Schedules, www.ephc.gov.au
- AS4482.1 – 2005 Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds
- AS4482.2 – 1999 Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile substances, www.standards.com.au
- State Environment Protection Policy (Prevention and Management of Contamination of Land) 2002, www.epa.vic.gov.au.

When is soil assessment undertaken?

Soil assessment may be required when children will have/have access to the soil at the service. There is no need to undertake soil assessment if no outdoor space is offered (some restricted licence services), or if the outdoor space has no exposed soil (for example it is located on the roof of a building).

Where children will have/have access to the soil the Department requires preliminary investigation of the soil at:

- all proposed sites of children's services, including sites with or without buildings¹.
- those existing licensed children's services, meeting the following criteria:
 - application is received to alter or extend the premises
 - the alteration or extension requires earthworks or deep excavations (exceeding a depth of 1 metre)
 - the works are going to take place in an area that is used for children's outdoor play or will be used for children's outdoor play after the work is completed
 - soil assessment has not been undertaken at the children's service.

Minor landscaping, creation of sand pits, movement of play equipment and so on do not qualify as earthworks. These alterations do not require a licence application to alter or extend the premises and do not require soil assessment.

¹ If land is re-zoned planning authorities will require some form of soil assessment to be undertaken.

However, building works and some playground renovations are likely to involve earthworks that may expose deeper soils that may be potentially contaminated. These types of alterations generally require council approval, do require a licence application to alter or extend the premises with an accompanying soil assessment.

(If a soil assessment has already been undertaken at the site please refer to page 5, *When may the requirement for soil assessment have already been met?* There is no need to conduct a second soil assessment under these circumstances.)

Soil assessment in children's services

Assessing the soil for a children's service licence application may require three levels of investigation:

- Stage 1: Preliminary investigation (with or without soil sampling)
- Stage 2: Detailed site investigation
- Stage 3: Site-specific human health risk assessment.

The Department requires preliminary investigation as a minimum. However, it is acknowledged that some soil assessments proceed from one stage to the next due to the complexity of the site.

Stage 1: Preliminary investigation

Preliminary investigation should be undertaken in accordance with AS4482.1 - 2005, section 3, AS4482.2 - 1999 and National Environment Protection Measure 1999 (NEPM), Schedule B (2) and involves the following components:

- establishing a site history
- detailing the proposed use
- reviewing local geology and hydrology
- conducting a site inspection (paying particular attention to presence of naturally elevated levels of potentially harmful substances, potentially contaminated fill and presence of any offensive odours from the site).

Preliminary investigation with sampling

The consultant may consider during the site inspection that it is prudent to undertake initial sampling and analysis of a limited range of substances across the site. They may decide to limit soil sampling to smaller parts of the site where children may be exposed to the potential substances, in which case sampling has to adequately represent potential exposures for the site.

The consultant should use the plan of the service to identify the areas where children may have access and ensure these areas are sampled. This includes children's sandpits or vegetable gardens, if it is uncertain whether a barrier exists between the sand and the soil.

Appendix 1 of NEPM Schedule B (2) and AS4482.1 - 2005 lists possible common analytes for soil contamination. Analytes selected for testing will be governed by the site history.

The sampling plan should have an acceptable probability of detecting the presence of substances. AS4482.1 – 2005, sections 3 and 7, provide guidance in relation to appropriate sampling density. Composite sampling will not be accepted.

The report should append all of the site information and analyses (preferably on CD), including:

- a site plan depicting the number, depth and location of samples collected, attaching corresponding analytical results of soil samples
- the rationale for selection of the assessment locations related to the location's usage, for example areas the children will use in their play.

The NEPM Schedule B (7A), *Guideline on Health-Based Investigation Levels*, lists the Health Investigation Levels (HILS)² for a range of contaminants for children's services, such as childcare centres and kindergartens (HIL-A category).

In a preliminary investigation, HILS can be used as an indicator to confirm the likelihood of contamination, and therefore act as a trigger to assist in judging whether a detailed site investigation is necessary.

At the end of the preliminary investigation, with or without soil sampling, the environmental consultant will conclude **one** of the following:

- the soil at the site is not likely to be contaminated and is not likely to pose a risk to human health. There is no need for further assessment
- the soil at the site is contaminated, or there is likelihood of contamination, and there is enough information to devise a Soil Management Plan (SMP), to control the potential human health risk. There is no need for further assessment.

(The Department may include the provisions of the SMP as conditions on the children's service licence, if the licence is granted.)

- it is not possible to adequately assess the human health risk from potential contamination at the site and a more detailed site investigation (involving more sampling) is required (See Stage 2).

Stage 2: Detailed site investigation

A detailed site investigation is required if the results of the preliminary investigation are insufficient to enable site management strategies to be devised for a SMP.

Detailed site investigations should be carried out in accordance with NEPM Schedules B (2) and (3) and AS 4482.1 - 2005 sections 4, 6 and 7 and AS4482.2 - 1999.

The detailed investigation stage should delineate the lateral and vertical extent of contamination and the sampling plan may incorporate both judgmental and grid-based sampling patterns. Before comparison of soil results to HILS is made in order to make a human health risk assessment, there should be sufficient characterisation of the site to ensure the comparisons are meaningful and appropriate.

The report should append all of the site information and analyses (preferably on CD), including:

- a site plan showing the number, depth and location of samples collected attaching corresponding analytical results of soil samples
- the rationale for selection of the assessment locations related to the location's usage, for example areas the children will use in their play.

Samples must be analysed according to NEPM Schedule B3, using laboratories that are accredited by the National Association of Testing Authorities, www.nata.asn.au, for the particular analysis being undertaken.

When interpreting the results of sampling, reference should be made to the Guidance Values in NEPM Schedule B7 (A) *Guideline on Health-Based Investigation Levels* and Schedule 7 (B) *Guidelines on Exposure Scenarios and Exposure Settings*, www.ephc.gov.au.

² HILS (..) are neither clean up or response levels, nor are they desirable soil quality criteria. They are to be used for contamination only and are intended to prompt further appropriate site-specific assessment when they are exceeded.

Inappropriate use of investigation levels as default remediation criteria may result in unnecessary remediation adding to development costs, causing unnecessary disturbance to the site and local environment and potential waste of valuable landfill space. Similarly, it is an abuse of investigation levels if they are interpreted as condoning contamination to these levels. Land is usually remediated to an extent that optimises current and future land use.

Site-specific health assessment should be conducted where exceedance of investigation levels indicates there is likelihood of adverse effects on human health. (From NEPM Schedule B1, page 4).

For the site to comply with the NEPM guidance on the basis of average concentrations (where adequate sampling and characterisation have been performed), the soil sample results for each substance identified at each stratum of soil tested will meet the following relevant NEPM criteria (or other approved criteria where no NEPM criteria exist³):

The arithmetic mean of the data for each substance is below the relevant HIL, the standard deviation of the data is less than half the relevant HIL and no individual sample exceeds 2.5 times the relevant HIL.

At the end of the detailed investigation the environmental consultant will conclude **one** of the following:

- The soil sample results for each substance identified for each stratum of soil tested do not exceed the relevant HIL criteria⁴ and there is no evidence of an unacceptable health risk and no offensive odours associated with the site. There is no need for further assessment.
- The soil sample results exceed the HIL criteria for nominated substances and/or there is evidence of a potential unacceptable health risk and there is enough information to devise a Soil Management Plan (SMP) to control the potential health risk. There is no need for further assessment.

(The Department may include the provisions of the SMP as conditions on the children's service licence, if the licence is granted.)

- The soil sample results exceed the HIL criteria for nominated substances and/or there is evidence of a potential unacceptable human health risk. A site-specific human health risk assessment is recommended (See Stage 3).

Stage 3: Site-specific human health risk assessment

The site-specific human health risk assessment is specific to the site and the proposed use of that site. It is undertaken to determine if adverse health effects are likely to occur from the soil contamination. It should be conducted according to NEPM Schedule B (4), Guideline on Health Risk Assessment Methodology.

When interpreting the results of sampling, reference should be made to the guidance values in NEPM Schedule B7 (A) *Guideline on Health-Based Investigation Levels* and Schedule 7 (B) *Guidelines on Exposure Scenarios and Exposure Settings*, www.ephc.gov.au.

The recommendation for action to be taken, if any, will depend on the assessment of risk associated with a given level of contamination. The response will be modulated by factors including:

- consideration of local background levels
- whether there is a single substance or multiple substances
- the depth, level and distribution of substances at the site
- properties of the substances(s) for example, how easy it is to absorb
- access to the site surface, for example, paved, grassed, exposed bare soils, tanbark with lining.

The report should append all of the site information and analyses (preferably on CD), including:

- a site plan depicting the number, depth and location of samples taken in the detailed assessment, attaching corresponding analytical results of soil samples
- the rationale for selection of the assessment locations related to the location's usage, for example areas the children will use in their play.

³ If no NEPM criteria have been derived for the contaminant/s on site, contact the Environment Protection Authority to discuss alternative criteria.

⁴ This means the arithmetic mean of the level of each substance is below the relevant HIL, the standard deviation is less than half the relevant HIL and no individual sample exceeds 2.5 times the relevant HIL.

At the end of the site-specific human health risk assessment the environmental consultant will conclude:

- the concentration of substances present in the soil is not at levels that pose an unacceptable risk to human health
- a remediation or management strategy is required as part of a Soil Management Plan (SMP) to control the potential health risk

(The Department may include the provisions of the SMP as conditions on the children's service licence, if the licence is granted.)

In some circumstances the SMP may be complex, expensive and time consuming to implement and the owner of the land may make the decision that it is not practicable to implement. However, without an SMP such a site would not be granted an Approval of Premises for the location of a licensed children's service and an alternative location would need to be sought.

Reporting results

The Department has developed a form, **Soil Assessment Summary Report**, to be completed by the environmental consultant, appending all of the site information and analyses reported in accordance with Section 6 of NEPM Schedule B (2). The completed report must be provided to the applicant to lodge as part of the children's service Approval of Premise process.

The Soil Assessment Summary Report may be referred to the Environment Protection Authority, the Environmental Health Unit of the Department and/or the responsible planning authority for comment, prior to any decision in relation to the children's service licensing application.

The Department will use this information in considering whether to grant an Approval of Premises and to define any conditions or restrictions that may apply to the children's service licence.

When may the requirement for soil assessment have already been met?

The requirement for soil assessment may have been met when:

- Soil assessment⁵ has been undertaken at the site of the proposed or actual location of the children's service and that assessment report is available to the Department.
- The site has been issued with a Certificate of Environmental Audit or Statement of Environmental Audit produced in consideration of the sensitive use of the land. The children's services applicant may provide a copy of this Certificate or Statement to the Department.
- The relevant planning authority identifies that an **environmental audit** is required before the planning permit may be issued to use the land for sensitive use such as a children's service. In this case, a site assessment will be conducted as part of the audit process and a separate soil assessment is not required to comply with these guidelines. The environmental audit will produce either a Certificate of Environmental Audit or Statement of Environmental Audit, a copy of which may be submitted with the children's services Approval of Premises application.

The Department will confirm if the applicant does not need to undertake a further soil assessment for the purposes of a children's services licence in these circumstances.

Further information

The **Department of Education and Training** is the Regulatory Authority in Victoria. Phone: 1300 307 415

Email: licensed.childrens.services@edumail.vic.gov.au

Web: www.education.vic.gov.au/childhood/providers/regulation

⁵ Soil investigations are carried out to achieve specific objectives and have a purpose, scope and limitations statement. A previous soil assessment of the site must be appropriate and sufficient for its intended use as a children's service.