

AS4419: 2003 Soils for Landscaping and Garden Use - Natural Soil or Soil Blend Analysis

Sample Drop Off: 16 Chilvers Road
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Batch N°: 24145	Sample N°: 2	Date Received: 11/10/12	Report Status: <input type="radio"/> Draft <input checked="" type="radio"/> Final
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Client Name: Specialised Sand & Soil	Project Name: Benchmark Testing 10/2012
Client Contact: Geoff Green	Location:
Client Job N°:	SESL Quote N°:
Client Order N°:	Sample Name: Screened Soil
Address: PO Box 345 ROUND CORNER NSW 2158	Description: Soil
	Test Type: 4419_NS, PSA_AS, NSW BIO_S

RECOMMENDATIONS

This sample when compared against the criteria for compliance to AS 4419 Natural Soil/Soil Blend meets the requirements with the exception of organic matter and large particles. This soil is fit for purpose for some situations (e.g. turf underlay, top dressing) however to comply with AS4419 add a further 20-25% by volume of AS4454 compliant composted soil conditioner or equivalent to the mix. Depending on the intended use, the large particles (i.e. particles greater than 20mm and 10-20mm) maybe an issue. There are many situations where large particles are not an issue. Alternatively, the material should be screened to minus 20mm to remove these oversize particles.

All materials claiming compliance to AS4419 must fully comply with the chemical and organic contaminant provisions of the current version of the national guidelines for the use and disposal of Biosolid products that are for Unrestricted Use (Grade A). This requirement is irrespective of whether materials do or do not contain Biosolids. This material satisfies the contaminant grade requirement of **Unrestricted Use (Grade A)**.

SCHEME OF SOILS TESTING ^A

Property	Unit	Requirement	Result	Comments
Bulk density	kg/L	> 0.7	1.11	Satisfactory
Organic Matter ^B	% dry wt	3 – 15 ^B	1.8	Unsatisfactory
Wettability	mm/min	> 5	48.7	Satisfactory
pH in H ₂ O (1:5) ^C	pH units	5.5 – 7.5 ^C	7.5	General and alkaline soil, see footnote C
Electrical Conductivity (1:5)	dS/m	< 1.2 ^D	0.07	Satisfactory
Phosphorus content	mg/kg	Very P Sensitive < 5 P Sensitive < 20	21.5	Unsuitable for all P sensitive spp. Generally suitable for P tolerant spp.
Dispersibility in H ₂ O (1:5) in CaCl ₂ (1:5)	Category	1 – 2 ^E	1.0	Satisfactory
			1.0	See Footnote E
Nitrogen drawdown	–	> 0	-	Did not test
Toxicity	mm	≥ 70	84	Satisfactory
Permeability	cm/hr	2 – 100	2.3	Satisfactory
Soil texture	Class	Sand – Clay loam ^F	Fine Sandy Loam	Satisfactory
Typical clay content	% by mass	NR ^G	Did not test	See Footnote G
Large particles	% by mass	< 10 mm	NR	No requirement
		10 - 20 mm	≤ 8	Unsatisfactory
		> 20 mm	≤ 2	Unsatisfactory
Plant propagule content	Detection	Absent		Did not test

FOOTNOTES:

A. AS4419: 2003 Table 1 - Scheme of Soils Testing.

B. Organic Matter method used: Dumas Combustion

It is recommended that landscape soils containing greater than 20% by mass organic matter not be used in any outdoor landscaping, including on-slab installations, other than in tubs, small containers or as an additive to improve an in situ soil. In selected situations, their installation may be acceptable but they should not be applied to a depth exceeding 150mm. Inclusion at greater depths could lead to putrefaction and consequential damage to plants.

C. When tested in accordance with Appendix D the following shall apply:

a) Soils other than those designated as being acid or alkaline shall have a pH of not less than 5.5 and not greater than 7.5

b) Acid soil shall have a pH of not less than 4.5 and not greater than 6.0

c) Alkaline soil shall have a pH of not less than 7.0 and not greater than 8.5

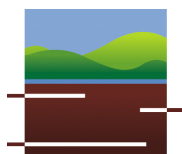
D. Where the EC of a soil blend or natural soil exceeds 1.2 dS/m, supply of the soil shall be accompanied by documentation stating clear information about the salinity, the need to leach and the types of plants that will tolerate high salinity. For more information, seek expert advice, as the dilution or removal of salinity depends on depth, permeability, EC and other factors too variable to list here.

E. Where a soil exhibits Category 3 or 4 behaviour in water but Category 1 or 2 behaviour in CaCl₂ the soil is likely to be improved and pass the Dispersiveness Test through the addition of Gypsum (CaSO₄).

F. Soil blends and natural soils may have textures of sandy clay loam or fine sandy clay loam if the organic matter content is 10% by mass or greater.

G. Where possible, all general-purpose soils should contain some natural clay. Clay contents above 40% are generally considered to be unsuitable for general landscaping purposes.

NR denotes "No requirement". ND or DNT denotes "Did not test".



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CONTAMINANT CONCENTRATION THRESHOLDS^E

Category	Element	Results:	Contaminant Grade				Comments
			A	B	C	D	
Chemical Contaminants (mg/kg)	Arsenic (As)	2.7	≤20	≤20	≤20	≤30	Grade A - Unrestricted Use
	Cadmium (Cd)	<0.1	≤3	≤5	≤20	≤32	Grade A - Unrestricted Use
	Chromium (Cr)	42	≤100	≤250	≤500	≤600	Grade A - Unrestricted Use
	Copper (Cu)	27	≤100	≤375	≤2000	≤2000	Grade A - Unrestricted Use
	Lead (Pb)	7.3	≤150	≤150	≤420	≤500	Grade A - Unrestricted Use
	Mercury (Hg)	<0.05	≤1	≤4	≤15	≤19	Grade A - Unrestricted Use
	Nickel (Ni)	46	≤60	≤125	≤270	≤300	Grade A - Unrestricted Use
	Selenium (Se)	<2	≤5	≤8	≤50	≤90	Grade A - Unrestricted Use
	Zinc (Zn)	53	≤200	≤700	≤2500	≤3500	Grade A - Unrestricted Use
Organic Contaminants (mg/kg)	DDT/DDD/DDE	<0.02	≤0.5	≤0.5	≤1.0	≤1.0	Grade A - Unrestricted Use
	Aldrin	<0.02	≤0.02	≤0.2	≤0.5	≤1.0	Grade A - Unrestricted Use
	Dieldrin	<0.02	≤0.02	≤0.2	≤0.5	≤1.0	Grade A - Unrestricted Use
	Chlordane	<0.02	≤0.02	≤0.2	≤0.5	≤1.0	Grade A - Unrestricted Use
	Heptachlor	<0.02	≤0.02	≤0.2	≤0.5	≤1.0	Grade A - Unrestricted Use
	HCB	<0.02	≤0.02	≤0.2	≤0.5	≤1.0	Grade A - Unrestricted Use
	Lindane	<0.02	≤0.02	≤0.2	≤0.5	≤1.0	Grade A - Unrestricted Use
	BHC	<0.02	≤0.02	≤0.2	≤0.5	≤1.0	Grade A - Unrestricted Use
	PCBs	<0.2	ND ^A	≤0.3	≤1.0	≤1.0	ND ^A
Microbiological	E.coli	D.N.T.	<100 MPN ^B /g (dry weight)			Did not test	
Standards (Stabilisation Grade)	Faecal coliforms	-	<1000 MPN ^B /g (dry weight)			Did not test	
	Salmonella sp.	-	Not detected/50g of final product			Did not test	

Note A: No detected PCB's at a limit of detection of 0.2mg PCB/kg biosolids.

AS 4419 (2003) - Soils for landscaping and garden use

Clause 9 Compliance with National Health Standards states: "All materials shall fully comply with the chemical and organic contaminant provisions of the current version of the national or state guidelines for use and disposal of biosolid products that are for unrestricted use (i.e. Contaminant grade A), whichever is the more stringent. This requirement is irrespective of whether materials do or do not contain biosolids."

NOTES:

E. EPA NSW (1997) Environmental Guidelines: Use and disposal of Biosolids Products. Table 3.1 Contaminant Acceptance Concentration Thresholds.

F. No detected PCB's at a limit of detection of 0.2mg PCB/kg biosolids.

Table 3.6 Classification of biosolid products from the DEC NSW Environmental Guidelines: Use and disposal of biosolids products (1997) was used as the reference for Allowable land application use. Other allowable land application details may apply for other states.

* Restrictions apply to the selection of locations for surface land disposal.

Results given on a dry weight basis in mg/kg unless otherwise stated.
All analyses performed by NATA accredited sub-contracting laboratory.

Minimum quality grades			Allowable land application use							
Contaminant Grade	Stabilisation Grade	Classification	Home lawns & gardens	Public contact sites	Urban landscaping	Agriculture	Forestry	Soil & site rehabilitation	Landfill disposal	Surface land disposal
			A	A	Unrestricted Use	●	●	●	●	●
B	A	Restricted Use 1		●	●	●	●	●	●	●
C	B	Restricted Use 2				●	●	●	●	●
D	B	Restricted Use 3					●	●	●	●
E	C	Not Suitable For Use							●	●

"ND" denotes "Not determined." "DNT" denotes "Did not test."

Consultant:
Chantal Hooper

Authorised Signatory:
Murray Fraser

Date of Report:
29 Oct 2012