



Pells Sullivan Meynink

Imported Fill Protocol

Yiribana Logistics Estate
754-770 and 784-786 Mamre Road,
Kemps Creek, NSW

27 April 2021

60539 - 136338 (Rev 0)
JBS&G Australia Pty Ltd

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Abbreviations

Term	Definition
ACM	Asbestos Containing Material
AF/FA	Asbestos Fines/Fibrous Asbestos
ASS	Acid Sulfate Soils
ASSMAC	Acid Sulfate Soil Management Advisory Committee
BTEX	Benzene, toluene, ethylbenzene and xylenes
DECCW	NSW Department of Environment, Climate Change and Water
EC	Electrical Conductivity
ENM	Excavated Natural Materials
EPA	NSW Environment Protection Authority
IFP	Imported Fill Protocol
LOR	Limit of Reporting
MCF	Material Classification Form
NATA	National Association of Testing Authorities
NCR	Non Conformance Report
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
OCP	Organochlorine Pesticides
OEH	NSW Office of Environment and Heritage
PAH	Polycyclic Aromatic Hydrocarbons
PASS	Potential Acid Sulfate Soils
PCB	Polychlorinated Biphenyls
PFAS	Per- and poly-fluoroalkyl substances
POEO Act	Protection of the Environment Operations Act 1997
PQL	Practical Quantitation Limit
RRO/RRE	Resource Recovery Order/Exemption
TPH/TRH	Total Petroleum/Recoverable Hydrocarbons
UCL	Upper Confidence Limit
VENM	Virgin Excavated Natural Materials

1. Introduction

JBS&G Australia Pty Ltd (JBS&G) was engaged by Pells Sullivan Meynink (PSM) (the client) to prepare an Imported Fill Protocol (IFP) for the redevelopment of the Yiribana Logistics Estate, located at 754-770 and 784-786 Mamre Road, Kemps Creek, NSW (the site), as shown on **Figure 1**. The site is legally identified as Lots 59 and 60 of DP259135 and covers an area of approximately 33 hectares (ha).

To facilitate development, it is understood that approximately 128,000 m³ of fill material will be required to be imported to the site as part of bulk earthworks to raise site levels, etc. The quality of the imported fill material will require to be assessed to ensure that soil and/or rock materials imported to the site are compliant with NSW EPA made or endorsed guidelines, and are suitable (from a contamination perspective) for all intended land uses at the site (i.e. commercial/industrial land uses).

Fill materials imported to the site must be imported in accordance with relevant environmental regulations/guidelines, namely considering environmental/contamination requirements.

1.1 Objective

The objectives of this IFP are to outline the procedures and requirements to be followed to ensure bulk fill materials received on site comply with relevant environmental regulatory requirements and prevent the importation of materials to the site that are unsuitable, from a contamination perspective, for the intended commercial/industrial land use, pursuant to NEPC (2013).

1.2 Scope

The procedures described in this IFP relate to the importation to the site of environmentally suitable bulk fill material such as Virgin Excavated Natural Material (VENM) and Excavated Natural Materials (ENM).

Geotechnical requirements for imported bulk fill materials are not within the scope of this report.

2. Regulations and Guidelines

The importation of materials to the Site is regulated by the *Protection of the Environment Operations Act 1997* (POEO Act) and associated *Protection of the Environment Operations (Waste) Regulation 2014* (POEO Waste Regulation).

The following regulatory instruments/guidelines applying to imported materials were considered in preparation of this IFP:

- Waste Classification Guidelines (EPA 2014a);
- POEO Waste Regulation and relevant associated resource recovery order and exemption (RRO/RRE);
- National Environment Protection (Assessment of Site Contamination) Measure, National Environment Protection Council, 1999, amended 2013 (NEPC 2013 NEPM);
- Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd edition) (EPA 2017); and
- NSW EPA Sampling Design Guidelines – Contaminated Site (EPA 1955).

3. Approved Fill Material Types

Imported materials will only be accepted to the site for redevelopment if they:

- Meet the definition of VENM as defined in relevant legislations (**Section 3.1**); or
- Meet the definition of ENM as defined in relevant regulations (**Section 3.2**); and
- Appropriate documentation verifying the relevant classification is provided to and approved by JBS&G prior to importation.

3.1 Virgin Excavated Natural Material (VENM)

VENM is defined (POEO Act) as “natural material (such as clay, gravel, sand, soil or rock fines)” that has:

- Been excavated or quarried from areas that are not contaminated with manufactured chemicals or process residues, as a result of industrial, commercial, mining or agricultural activities; and
- Does not contain any sulfidic ores, soils or any other waste.

Material imported to the site as VENM must meet this or other subsequent definition in the POEO Act, as outlined in the NSW EPA Fact Sheet: VENM (**Appendix A**).

3.2 Excavated Natural Material (ENM)

All ENM to be imported to the site must be assessed in accordance with the ENM Order (EPA 2014b¹) (**Appendix B**) or subsequent versions.

ENM is defined as “naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:

- Been excavated from the ground;
- Contains at least 98% (by weight) natural material; and
- Does not meet the definition of Virgin Excavated Natural Material in the Act.

Excavated natural material does not include material located in a hotspot; that has been processed; or that contains asbestos, Acid Sulfate Soils (ASS), Potential Acid Sulfate Soils (PASS) or sulfidic ores.”

¹ *The Excavated Natural Material Order*. Resource Recovery Order under Clause 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014. NSW EPA (EPA,2014b).

4. Imported Material Requirements

As detailed below, appropriate documentation verifying the relevant classification of all materials must be completed and provided to the Environmental Consultant for approval prior to importation of materials to the site.

Alternatively, if the material has not been assessed or supplied documentation is inadequate, the Environmental Consultant can undertake the classification in accordance with the IFP prior to importation.

4.1 VENM Assessment

Assessment of VENM materials shall be undertaken in accordance with the requirements of NSW EPA 1995 and NEPC 2013 and incorporate a review of the Source Site history and inspection of materials prior to, as well as during, importation to the site. A VENM Assessment Report (or similar) prepared by a suitably qualified environmental consultant must be provided to the Environmental Consultant for approval (or completed by JBS&G) prior to importation of any VENM to the Site.

The VENM assessment for the site will require the following for each Source Site, prior to import:

- Review of a VENM report provided by the Source Site including details of the Source Site history, address, characteristics of the material (such as colour, soil type, odours), environmental setting (e.g. geology, potential acid sulfate soil, salinity), and potential for impact from activities at the Source Site and surrounds, including consideration of potential for impacts from per- and poly-fluoroalkyl substances (PFAS);
- Collection of a minimum of three primary samples for verification, plus QA/QC samples, at each Source Site by the Environmental Consultant. For volumes greater than 3,000 m³, additional characterisation/check sampling will be required at a rate of 1 sample per 1,000 m³;
- Samples should be analysed in accordance with the potential contaminants of concern identified during the review of site's history, and should include the following parameters as a minimum, unless these analytes are able to be discounted by review of the source site history (please note this list is not exhaustive and additional parameters may require analysis depending on the Source Site history and setting):
 - Heavy metals consisting of total arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc.
 - Total petroleum/recoverable hydrocarbons (TPH/TRH), benzene, toluene, ethylbenzene, xylenes (BTEX).
 - Polycyclic aromatic hydrocarbons (PAHs).
 - Organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs).
 - Electrical conductivity (EC), potential hydrogen (pH).
 - Asbestos (40g sample, presence/absence).
- Sample analytical results must not be detectable levels above laboratory limits of reporting², with the exception of metals, pH and EC;

² It is noted some soils may show trace/minor levels of TRH due to natural organic materials. Such instances may require additional analysis (e.g. TRH with silica-gel clean-up) or further assessment by the Environmental Consultant and may still result in refusal to import such soils.

- Metal detections must be at levels within published background ranges, such as those provided in the NEPC 2013 guidelines. Where heavy metals may be naturally elevated in sourced natural materials, appropriate basis must be provided and concentrations must meet appropriate land use criteria for the redevelopment (i.e. commercial/industrial land use, pursuant to NEPC 2013 health-based and ecological investigation/screening levels);
- pH and EC detections must comply with the chemical concentrations listed in Column 2 and Column 3 of Table 4 of the ENM Order 2014 (refer to **Appendix B** for additional information); and
- Laboratory report(s) from a NATA accredited laboratory and chain of custody documentation, in addition to other QA/QC documentation to demonstrate the samples were obtained using appropriate procedures by suitably qualified personnel, samples were analysed within relevant holding times, and data is reliable.

Potential VENM will also be assessed to ensure it does not contain ASS or PASS, in accordance with the ASS Manual (ASSMAC, 1998³). Where the maximum average concentration for characterisation of pH of the material is less than 5 and EC is greater than 1.5dS/m, a review of applicable ASS Risk Maps will be required to indicate the potential presence of ASS. Based on the chemical concentrations outlined in ENM Order 2014, additional sample analysis by sPOCAS method, may be undertaken as required.

4.2 ENM Assessment

The requirements of ENM assessment are provided in the ENM Order 2014 and associated ENM Exemption 2014 (**Appendix B**). Future NSW EPA revisions to these may require amendment to requirements of this IFP.

For all ENM Source Sites, documentation must be provided to show that ENM has been assessed in accordance with the ENM Order/Exemption (NSW EPA 2014). An ENM Assessment Report prepared by a suitably qualified environmental consultant (which must include an assessment of the environmental setting and potential for historical contaminating activities (at and surrounding the Source Site), summary data tables, sampling plan, figures presenting the Source Site location and sampling locations, and laboratory reports from a NATA accredited laboratory) must be provided for the Environmental Consultant's review prior to importation of any ENM.

The frequency of sampling for ENM assessment must be undertaken in accordance with the sampling frequencies provided in Table 1 and Table 2 of the ENM Order 2014 (**Appendix B**).

In addition to the sampling and analytical requirements of the ENM Order (NSW EPA 2014), additional soil samples should be analysed in accordance with the potential contaminants of concern identified during the review of source site's history, and should include the following parameters as a minimum (please note this list is not exhaustive and additional parameters may require analysis depending on the Source Site history and setting):

- Organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs); and
- Asbestos (40g sample, presence/absence).

Sample analytical results must be reported below the limits outlined in Table 4 of the ENM Order (NSW EPA 2014). OCPs/PCBs and Asbestos must be non-detect. In addition to the above, concentrations must meet appropriate land use criteria for the redevelopment (i.e.

³ *Acid Sulfate Soil Manual*. Acid Sulfate Soil Management Advisory Committee, August 1998 (ASSMAC 1998).

commercial/industrial land use, pursuant to NEPC 2013 health-based and ecological investigation/screening levels).

4.3 Supporting Documentation

All materials proposed to be imported to site must be accompanied by appropriate supporting documentation which demonstrates the materials conformance to all regulatory requirements.

The supporting documentation must be provided to the Environmental Consultant at the earliest practical date prior to import to allow sufficient time to review the documentation, visit the source site to inspect and sampling proposed material and arrange analysis of verification samples (refer to timing requirements in **Section 4.9**). The Environmental Consultant will review the supporting documentation and advise the client and Principal Contractor (PC) whether the material and documentation satisfy all regulatory requirements and is suitable for importation and use at the site.

If the material characterisation and documentation supplied is found by the Environmental Consultant to be deficient, the Environmental Consultant will advise the client and Principal Contractor regarding the deficiencies and whether additional characterisation and/or documentation is required.

4.4 Source Site Material Inspections

Each source site of imported material must be inspected by the Environmental Consultant.

4.5 Non-Conformances Prior to Import

In the event materials do not meet the requirements detailed above, materials will not be approved for importation to the site (unless deficiencies are rectified by the supplier or the Environmental Consultant completes an assessment) and an alternative Source Site will need to be provided by the Supplier and be investigated to confirm conformance.

4.6 Approval Prior to Importation

All imported materials must meet the approval of the client and/or their appointed representative, and the Environmental Consultant. Documentation as outlined above (such as the VENM or ENM Assessment Reports) must be provided to the client and the Environmental Consultant for review and approval prior to importation of any materials to the site, noting the timing requirements in **Section 4.9**.

The client/the Environmental Consultant reserves the right to refuse material at their discretion or if supporting documentation does not meet the requirements outlined in this IFP or legislative guideline requirements, or if material brought to the site is not consistent with the supporting documentation (refer **Sections 4.3**).

the Environmental Consultant will be required to provide formal written correspondence approving each material type for importation to the site prior to the commencement of material importation. These documents will form part of the validation of the site and will be subject to review by the appointed NSW EPA accredited Site Auditor.

4.7 Onsite Audits/Material Inspections

In addition to inspection requirements prior to import (**Section 4.4**), the client and the Environmental Consultant must have the ability to conduct random Source Site inspections during importation of material to the site.

In the event that Source Site material being excavated/loaded for transport to the site is not consistent with that originally investigated and approved, approval for importation may be rescinded and import to the site may cease until a revised approval is granted.

4.8 Transport Requirements

The supplier/importer/transporter of fill will be responsible for ensuring appropriate transport of approved fill to the site consistent with all relevant legislation, and, if necessary, (where fill is deemed unsatisfactory upon arrival) returned to the Source Site or disposed lawfully. This includes ensuring the receiving site is accepting fill at the time.

4.9 Timing

If a material assessment has not already been undertaken, the following times are required for testing of materials by the Environmental Consultant prior to approvals being granted:

- Up to 8 days for VENM assessment; and
- 10 days for ENM assessment.

There is the potential for the proposed timings to be constrained subject to consultation with the Environmental Consultant.

5. Conclusions

It is considered that successful implementation of the processes outlined in this IFP, will ensure the bulk fill imported to the site meets appropriate regulatory requirements and is environmentally suitable for the intended site use.

6. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body of the report for purposes beyond the intent. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

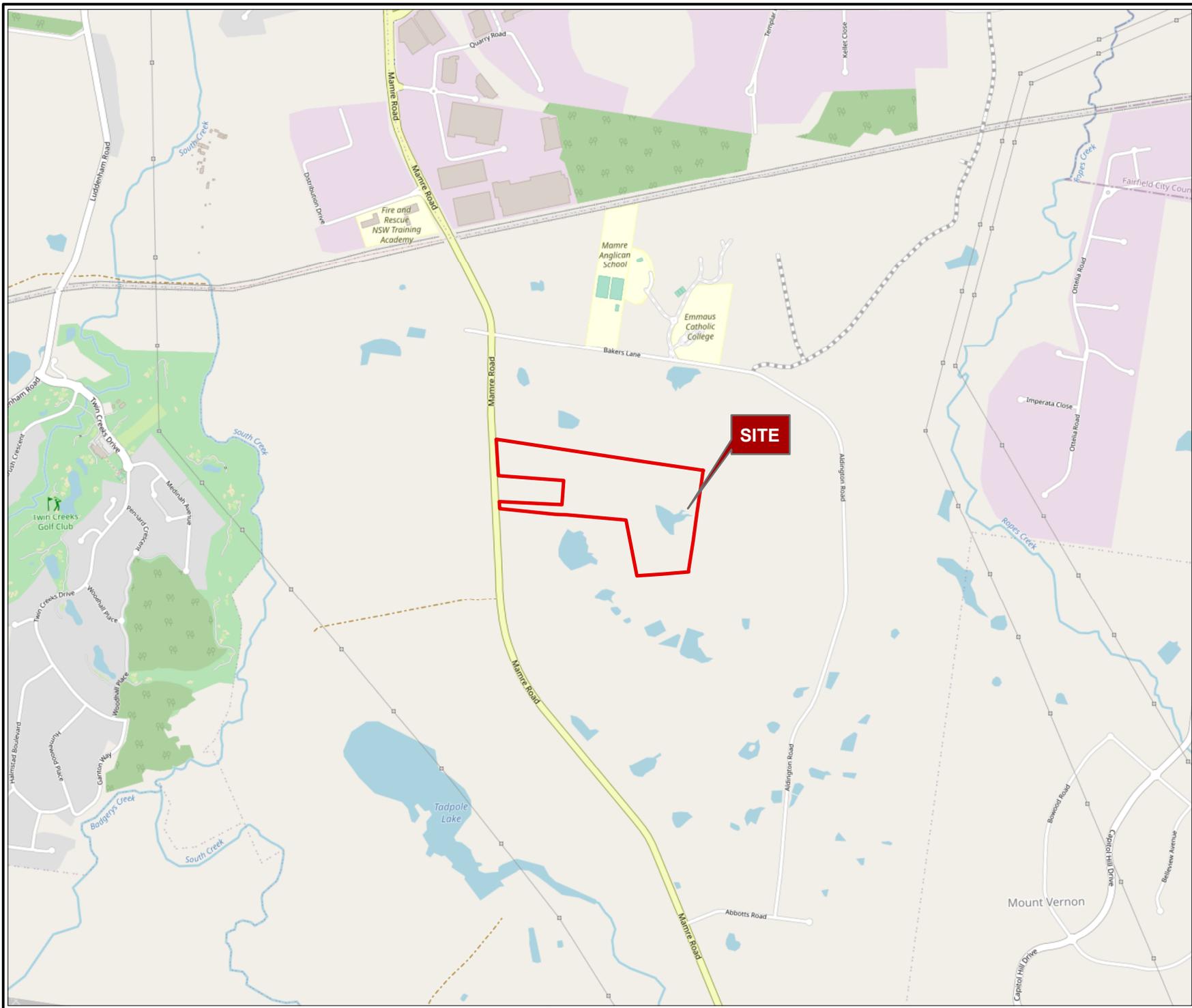
Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Information provided by the client indicated limited sampling and laboratory analyses by others was undertaken as part of previous investigations, however specific investigation reports were not available for review in preparing this document. It is noted that ground conditions between sampling locations and media may vary, and further chemicals or categories of chemicals may exist at the site, which were not identified in the information provided and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to previous investigations, through natural processes or through the intentional or accidental addition of contaminants. The information presented in this report are based on the information obtained at the time of preparation.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Figures



Legend
 Approximate Site Boundary



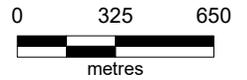
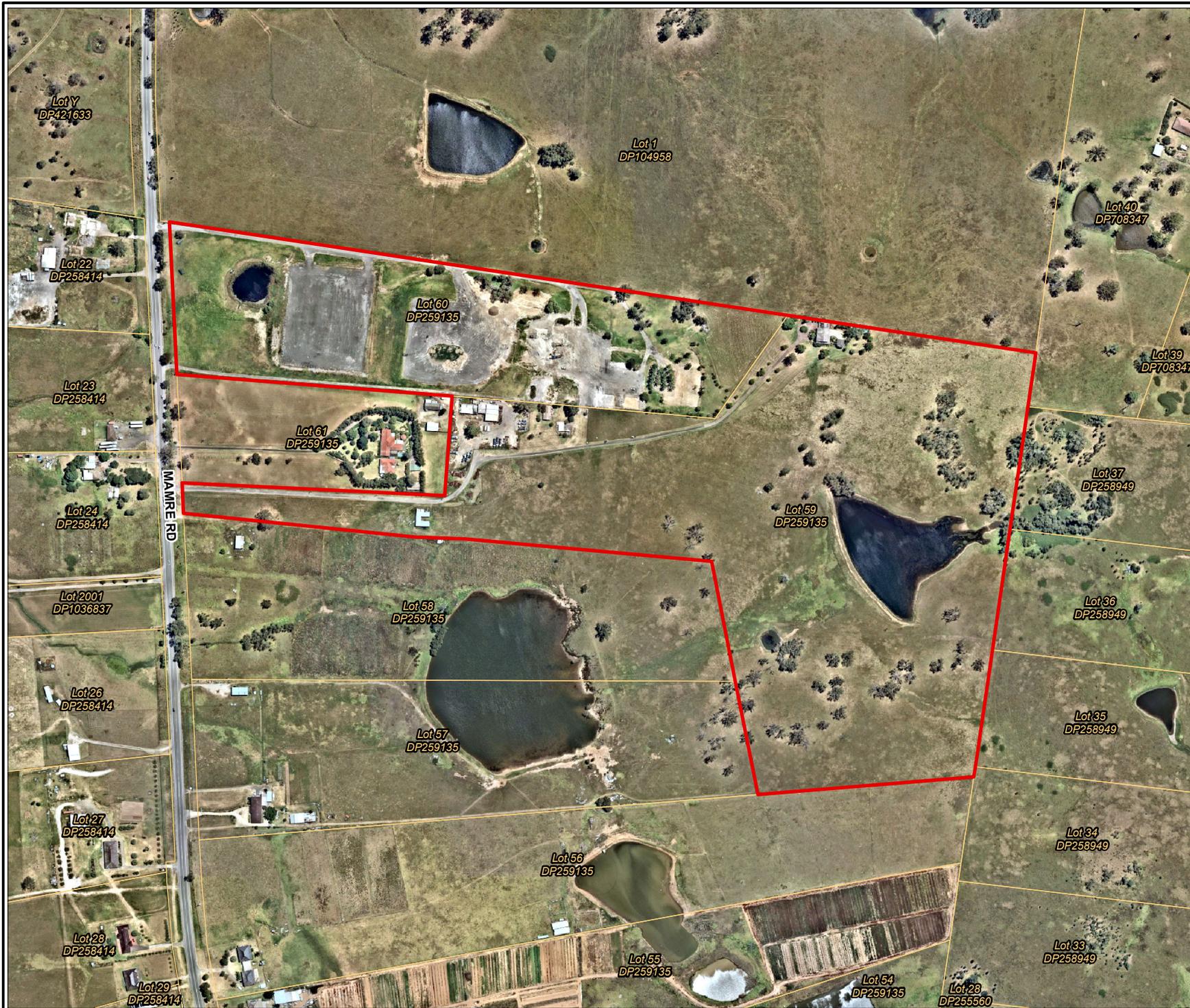
Job No: 60539	
Client: Pells Sullivan Meynink	
Version: R01 Rev A	Date 16/03/2021
Drawn By: RF	Checked By: RC
Scale 1:25,000	
	
Coord. Sys. GDA 1994 MGA Zone 56	
772-786 Mamre Road Kemps Creek, NSW	
SITE LOCATION	

FIGURE 1

File Name: N:\Projects\Pells Sullivan Meynink\60539 754 - 786 Mamre Rd, Kemps Creek\GIS\Maps\R01 Rev A\60539_01_SiteLocation.mxd
 Reference: Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA



- Legend**
- Approximate Site Boundary
 - NSW Cadastre (DFSI, 2021)



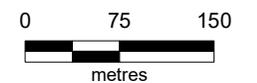
Job No: 60539

Client: Pells Sullivan Meynink

Version: R01 Rev A Date 16/03/2021

Drawn By: RF Checked By: RC

Scale 1:6,000



Coord. Sys. GDA 1994 MGA Zone 56

**772-786 Mamre Road
Kemps Creek, NSW**

SITE LAYOUT

FIGURE 2

Appendix A: Fact Sheet: Virgin Excavated Natural Material

Certification: Virgin excavated natural material



1. I [full name]
of [organisation
and address]

certify that the waste as set out in section 2 of this notice is Virgin Excavated Natural Material (VENM) as defined in Schedule 1 of the *Protection of the Environment Operations Act 1997*.

This certification is made on behalf of the waste generator [fill out if applicable]
being [full name]
of [organisation
and address]

2. The waste was generated at:
Street address:

Title reference (Lot/DP, etc.):
The amount of waste
(by volume or weight) is:

3. I have made the determination that the waste is VENM because:

- I have assessed the historical and current land use of the site at which the waste was generated.
- The waste is not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities.
- The waste does not contain any sulfidic ores or soils.
- The waste does not contain any other waste.
- The waste does not contain asbestos in any form.

Note: that all sections of this form must be completed including all boxes checked in Section 3 above and signed below for any material to be certified as VENM.

Signature(s)
Name(s) (printed)
Date

Warning: There are significant penalties under s.144AA of the *Protection of the Environment Operations Act 1997* for a person who supplies (whether knowingly or not) information that is false or misleading in a material respect about waste.

This certificate is intended to assist waste generators, contractors and/or receivers of VENM to have confidence that a range of relevant factors have been considered in the classification of a waste material as VENM.

Published by:

Environment Protection Authority, 59–61 Goulburn Street, Sydney South 1232

Ph: 131 555. TTY users: phone 133 677, then ask for 131 555

Speak and listen users: phone 1300 555 727, then ask for 131 555

Email: info@environment.nsw.gov.au; Web: www.epa.nsw.gov.au

Report pollution and environmental incidents: Environment Line: 131 555 (NSW only)

EPA 2013/0693; September 2013

Appendix B: The Excavated Natural Material Order 2014



Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014

The excavated natural material order 2014

Introduction

This order, issued by the Environment Protection Authority (EPA) under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation), imposes the requirements that must be met by suppliers of excavated natural material to which 'the excavated natural material exemption 2014' applies. The requirements in this order apply in relation to the supply of excavated natural material for application to land as engineering fill or for use in earthworks.

1. Waste to which this order applies

- 1.1. This order applies to excavated natural material. In this order, excavated natural material means naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:
- a) been excavated from the ground, and
 - b) contains at least 98% (by weight) natural material, and
 - c) does not meet the definition of Virgin Excavated Natural Material in the Act.

Excavated natural material does not include material located in a hotspot; that has been processed; or that contains asbestos, Acid Sulfate Soils (ASS), Potential Acid Sulfate soils (PASS) or sulfidic ores.

2. Persons to whom this order applies

- 2.1. The requirements in this order apply, as relevant, to any person who supplies excavated natural material, that has been generated, processed or recovered by the person.
- 2.2. This order does not apply to the supply of excavated natural material to a consumer for land application at a premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

3. Duration

- 3.1. This order commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

4. Generator requirements

The EPA imposes the following requirements on any generator who supplies excavated natural material.

Sampling requirements

- 4.1. On or before supplying excavated natural material, the generator must:
 - 4.1.1. Prepare a written sampling plan which includes a description of sample preparation and storage procedures for the excavated natural material.
 - 4.1.2. Undertake sampling and testing of the excavated natural material as required under clauses 4.2, 4.3, and 4.4 below. The sampling must be carried out in accordance with the written sampling plan.
- 4.2. The generator must undertake sampling and analysis of the material for ASS and PASS, in accordance with the NSW Acid Sulfate Soil Manual, Acid Sulfate Soils Management Advisory Council, 1998 and the updated Laboratory Methods Guidelines version 2.1 – June 2004 where:
 - 4.2.1. the pH measured in the material is below 5, and/or
 - 4.2.2. the review of the applicable Acid Sulfate Soil Risk Maps (published by the former Department of Land and Water Conservation and available at <http://www.environment.nsw.gov.au/acidsulfatesoil/riskmaps.htm>) indicates the potential presence of ASS.
- 4.3. For stockpiled material, the generator must:
 - 4.3.1. undertake sampling in accordance with Australian Standard 1141.3.1-2012 Methods for sampling and testing aggregates – Sampling – Aggregates (or equivalent);
 - 4.3.2. undertake characterisation sampling by collecting the number of samples listed in Column 2 of Table 1 with respect to the quantity of the waste listed in Column 1 of Table 1 and testing each sample for the chemicals and other attributes listed in Column 1 of Table 4. For the purposes of characterisation sampling the generator must collect:
 - 4.3.2.1. composite samples for attributes 1 to 10 and 18 in Column 1 of Table 4.
 - 4.3.2.2. discrete samples for attributes 11 to 17 in Column 1 of Table 4.
 - 4.3.2.3. The generator must carry out sampling in a way that ensures that the samples taken are representative of the material from the entire stockpile. All parts of the stockpile must be equally accessible for sampling.
 - 4.3.2.4. for stockpiles greater than 4,000 tonnes the number of samples described in Table 1 must be repeated.
 - 4.3.3. store the excavated natural material appropriately until the characterisation test results are validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 4 and the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 1

Sampling of Stockpiled Material		
Column 1	Column 2	Column 3
Quantity (tonnes)	Number of samples	Validation
<500	3	Required
500 – 1,000	4	
1,000 – 2,000	5	
2,000 – 3,000	7	
3,000 – 4,000	10	

4.4. For in situ material, the generator must:

- 4.4.1. undertake sampling by collecting discrete samples. Compositing of samples is not permitted for in-situ materials.
- 4.4.2. undertake characterisation sampling for the range of chemicals and other attributes listed in Column 1 of Table 4 according to the requirements listed in Columns 1, 2 and 3 of Table 2. When the ground surface is not comprised of soil (e.g. concrete slab), samples must be taken at the depth at which the soil commences.
- 4.4.3. undertake sampling at depth according to Column 1 of Table 3.
- 4.4.4. collect additional soil samples (and analyse them for the range of chemicals and other attributes listed in Column 1 of Table 4), at any depth exhibiting discolouration, staining, odour or other indicators of contamination inconsistent with soil samples collected at the depth intervals indicated in Table 3.
- 4.4.5. segregate and exclude hotspots identified in accordance with Table 2, from material excavated for reuse.
- 4.4.6. subdivide sites larger than 50,000 m² into smaller areas and sample each area as per Table 2.
- 4.4.7. store the excavated natural material appropriately until the characterisation test results are validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 4 and the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 2

<i>In Situ Sampling at surface</i>				
Column 1	Column 2	Column 3	Column 4	Column 5
Size of <i>in situ</i> area (m ²)	Number of systematic sampling points recommended	Distance between two sampling points (m)	Diameter of the hot spot that can be detected with 95% confidence (m)	Validation
500	5	10.0	11.8	Required
1000	6	12.9	15.2	
2000	7	16.9	19.9	
3000	9	18.2	21.5	
4000	11	19.1	22.5	
5000	13	19.6	23.1	
6000	15	20.0	23.6	
7000	17	20.3	23.9	
8000	19	20.5	24.2	
9000	20	21.2	25.0	
10,000	21	21.8	25.7	
15,000	25	25.0	28.9	
20,000	30	25.8	30.5	
25,000	35	26.7	31.5	
30,000	40	27.5	32.4	
35,000	45	27.9	32.9	
40,000	50	28.3	33.4	
45,000	52	29.3	34.6	
50,000	55	30.2	35.6	

Table 2 has been taken from NSW EPA 1995, *Contaminated Sites Sampling Design Guidelines*, NSW Environment Protection Authority.

Table 3

<i>In Situ Sampling at Depth</i>	
Column 1	Column 2
Sampling Requirements *	Validation
<p>1 soil sample at 1.0 m bgl from each surface sampling point followed by 1 soil sample for every metre thereafter.</p> <p>From 1.0 m bgl, sample at the next metre interval until the proposed depth of excavation of the material is reached. If the proposed depth of excavation is between 0.5 to 0.9 m after the last metre interval, sample at the base of the proposed depth of excavation.</p>	<p>Required if the depth of excavation is equal to or greater than 1.0 m bgl</p>

* Refer to Notes for examples

Chemical and other material requirements

- 4.5. The generator must not supply excavated natural material waste to any person if, in relation to any of the chemical and other attributes of the excavated natural material:
- 4.5.1. The chemical concentration or other attribute of any sample collected and tested as part of the characterisation of the excavated natural material exceeds the absolute maximum concentration or other value listed in Column 3 of Table 4:
- 4.5.2. The average concentration or other value of that attribute from the characterisation of the excavated natural material (based on the arithmetic mean) exceeds the maximum average concentration or other value listed in Column 2 of Table 4.
- 4.6. The absolute maximum concentration or other value of that attribute in any excavated natural material supplied under this order must not exceed the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 4

Column 1	Column 2	Column 3
Chemicals and other attributes	Maximum average concentration for characterisation (mg/kg 'dry weight' unless otherwise specified)	Absolute maximum concentration (mg/kg 'dry weight' unless otherwise specified)
1. Mercury	0.5	1
2. Cadmium	0.5	1
3. Lead	50	100
4. Arsenic	20	40
5. Chromium (total)	75	150
6. Copper	100	200
7. Nickel	30	60
8. Zinc	150	300
9. Electrical Conductivity	1.5 dS/m	3 dS/m
10. pH *	5 to 9	4.5 to 10
11. Total Polycyclic Aromatic Hydrocarbons (PAHs)	20	40
12. Benzo(a)pyrene	0.5	1
13. Benzene	NA	0.5
14. Toluene	NA	65
15. Ethyl-benzene	NA	25
16. Xylene	NA	15
17. Total Petroleum Hydrocarbons C ₁₀ -C ₃₆	250	500
18. Rubber, plastic, bitumen, paper, cloth, paint and wood	0.05%	0.10%

* The ranges given for pH are for the minimum and maximum acceptable pH values in the excavated natural material.

Test methods

- 4.7. The generator must ensure that any testing of samples required by this order is undertaken by analytical laboratories accredited by the National Association of Testing Authorities (NATA), or equivalent.
- 4.8. The generator must ensure that the chemicals and other attributes (listed in Column 1 of Table 4) in the excavated natural material it supplies are tested in accordance with the test methods specified below or other equivalent analytical methods. Where an equivalent analytical method is used the detection limit must be equal to or less than that nominated for the given method below.
 - 4.8.1. Test methods for measuring the mercury concentration.
 - 4.8.1.1. Analysis using USEPA SW-846 Method 7471B Mercury in solid or semisolid waste (manual cold vapour technique), or an equivalent analytical method with a detection limit < 20% of the stated absolute maximum concentration in Column 3 of Table 2 (i.e. < 0.20 mg/kg dry weight).
 - 4.8.1.2. Report as mg/kg dry weight.
 - 4.8.2. Test methods for measuring chemicals 2 to 8.
 - 4.8.2.1. Sample preparation by digesting using USEPA SW-846 Method 3051A Microwave assisted acid digestion of sediments, sludges, soils, and oils (or an equivalent analytical method).
 - 4.8.2.2. Analysis using USEPA SW-846 Method 6010C Inductively coupled plasma - atomic emission spectrometry, or an equivalent analytical method with a detection limit < 10% of the stated absolute maximum concentration in Column 3 of Table 2, (e.g. 10 mg/kg dry weight for lead).
 - 4.8.2.3. Report as mg/kg dry weight.
 - 4.8.3. Test methods for measuring electrical conductivity and pH.
 - 4.8.3.1. Sample preparation by mixing 1 part excavated natural material with 5 parts distilled water.
 - 4.8.3.2. Analysis using Method 103 (pH) and 104 (Electrical Conductivity) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
 - 4.8.3.3. Report electrical conductivity in deciSiemens per metre (dS/m).
 - 4.8.4. Test method for measuring Polynuclear Aromatic Hydrocarbons (PAHs) and benzo(a)pyrene.
 - 4.8.4.1. Analysis using USEPA SW-846 Method 8100 Polynuclear Aromatic Hydrocarbons (or an equivalent analytical method).
 - 4.8.4.2. Calculate the sum of all 16 PAHs for total PAHs.
 - 4.8.4.3. Report total PAHs as mg/kg dry weight.
 - 4.8.4.4. Report benzo(a)pyrene as mg/kg.

- 4.8.5. Test method for measuring benzene, toluene, ethylbenzene and xylenes (BTEX).
- 4.8.5.1. Method 501 (Volatile Alkanes and Monocyclic Aromatic Hydrocarbons) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
- 4.8.5.2. Report BTEX as mg/kg.
- 4.8.6. Test method for measuring Total Petroleum Hydrocarbons (TPH).
- 4.8.6.1. Method 506 (Petroleum Hydrocarbons) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
- 4.8.6.2. Report as mg/kg dry weight.
- 4.8.7. Test method for measuring rubber, plastic, bitumen, paper, cloth, paint and wood.
- 4.8.7.1. NSW Roads & Traffic Authority Test Method T276 Foreign Materials Content of Recycled Crushed Concrete (or an equivalent method).
- 4.8.7.2. Report as percent.

Notification

- 4.9. On or before each transaction, the generator must provide the following to each person to whom the generator supplies the excavated natural material:
- a written statement of compliance certifying that all the requirements set out in this order have been met;
 - a copy of the excavated natural material exemption, or a link to the EPA website where the excavated natural material exemption can be found; and
 - a copy of the excavated natural material order, or a link to the EPA website where the excavated natural material order can be found.

Record keeping and reporting

- 4.10. The generator must keep a written record of the following for a period of six years:
- the sampling plan required to be prepared under clause 4.1.1;
 - all characterisation sampling results in relation to the excavated natural material supplied;
 - the volume of detected hotspot material and the location;
 - the quantity of the excavated natural material supplied; and
 - the name and address of each person to whom the generator supplied the excavated natural material.
- 4.11. The generator must provide, on request, the characterisation and sampling results for that excavated natural material supplied to the consumer of the excavated natural material.

5. Definitions

In this order:

application or apply to land means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

Bgl means below ground level, referring to soil at depth beneath the ground surface.

composite sample means a sample that combines five discrete sub-samples of equal size into a single sample for the purpose of analysis.

consumer means a person who applies, or intends to apply excavated natural material to land.

discrete sample means a sample collected and analysed individually that will not be composited.

generator means a person who generates excavated natural material for supply to a consumer.

hotspot means a cylindrical volume which extends through the soil profile from the ground surface to the proposed depth of excavation, where the level of any contaminant listed in Column 1 of Table 2 is greater than the absolute maximum concentration in Column 3 of Table 2.

in situ material means material that exists on or below the ground level. It does not include stockpiled material.

in situ sampling means sampling undertaken on *in situ* material.

N/A means not applicable.

stockpiled material means material that has been excavated from the ground and temporarily stored on the ground prior to use.

systematic sampling means sampling at points that are selected at even intervals and are statistically unbiased.

transaction means:

- in the case of a one-off supply, the supply of a batch, truckload or stockpile of excavated natural material that is not repeated.
- in the case where the supplier has an arrangement with the recipient for more than one supply of excavated natural material, the first supply of excavated natural material as required under the arrangement.

Manager Waste Strategy and Innovation
Environment Protection Authority
(by delegation)

Notes

The EPA may amend or revoke this order at any time. It is the responsibility of each of the generator and processor to ensure it complies with all relevant requirements of the most current order. The current version of this order will be available on 'www.epa.nsw.gov.au'

In gazetting or otherwise issuing this order, the EPA is not in any way endorsing the supply or use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this order are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this order nor the accompanying exemption guarantee that the environment, human health or agriculture will not be harmed.

Any person or entity which supplies excavated natural material should assess whether the material is fit for the purpose the material is proposed to be used for, and whether this use may cause harm. The supplier may need to seek expert engineering or technical advice.

Regardless of any exemption or order provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The supply of excavated natural material remains subject to other relevant environmental regulations in the POEO Act and Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of this order, is guilty of an offence and subject to prosecution.

This order does not alter the requirements of any other relevant legislation that must be met in supplying this material, including for example, the need to prepare a Safety Data Sheet. Failure to comply with the conditions of this order constitutes an offence under clause 93 of the Waste Regulation.

Examples

In situ sampling at depth

Example 1.

If the proposed depth of ENM excavation is between 1 m bgl and 1.4 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- No further depth sampling after 1 m bgl, unless required under section 4.4.4.

Example 2.

If the proposed depth of ENM excavation is at 1.75 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- 1 sample at 1.75 m bgl.
- No further depth sampling after 1.75 m bgl, unless required under section 4.4.4.

Example 3.

If the proposed depth of ENM excavation is at 2.25 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- 1 sample at 2 m bgl.
- No further depth sampling after 2 m bgl, unless required under section 4.4.4.

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