Fill Management Plan

244-280 Aldington Road, Kemps Creek NSW

Prepared for: Stockland Development Pty Ltd. c/- AT&L

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ADE CONSULTING GROUP

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For and on behalf of

ADE Consulting Group Pty Ltd

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Contents

Abbreviations

ACM	Asbestos Containing Material
ADE	ADE Consulting Group Pty Ltd
COC	Chain of Custody
EPA	NSW Environmental Protection Authority
ENM	Excavated Natural Material
ERM	Environmental Resources Management
MBGL	Meters Below Ground Level
NATA	National Association of Testing Authorities
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NSW EPA	New South Wales Environmental Protection Authority
OEH	Office of Environment and Heritage
POEO	Protection of Environmental Operations
VAL	Validation
FMP	Fill Management Plan
VENM	Virgin Excavated Natural Material
SAC	Site Assessment Criteria
AF/FA	Asbestos fines/ Fibrous Asbestos
SDS	Safety Data Sheet
SSRRE	Site-specific Resource Recovery Exemption
SSRRO	Site-specific Resource Recovery Order

Definitions

Whenever the following terms occur in the Remedial Action Plan (RAP), they shall have the meanings defined below:

"Principal" means the Client.

"Contractor" means the company / person hired by the Principal that is responsible for the construction / remediation works.

"Consultant" means the person with CEnvP SC certification appointed by the Principal who shall inspect the compliance of the remediation procedures with the guidelines assigned by the NSW EPA.

"Works" means any process or activity carried out by the contractor during the construction works.

1 Introduction

1.1 Background

ADE have been commissioned by AT&L on behalf of Stockland Development Pty Ltd (the client) to prepare a fill management plan (FMP) for the assessment of fill to be imported to the Aldington upgrade site at Kemps Creek, New South Wales (NSW) (hereafter referred to as 'the site'). The FMP is applicable for assessing the suitability of soil / rock fill materials to be imported onto the site for application as engineering fill and/or earthworks associated with the road upgrades.

The purpose of the FMP is to set out the requirements for imported materials with respect to contamination. Application of this FMP to all soil/ rock materials will provide a consistent approach to the management of materials with respect to their suitability for use as part of the construction and upgrade works. The FMP will serve as a tool for the future construction/ importation be used as a resource. The site will accept materials classified as virgin excavated natural material (VENM), excavated natural material (ENM) and any site-specific resource recovery exemption / order (SSRRE) as granted by the NSW Environmental Protection Authority (EPA).

ADE considers that it is the responsibility of the client and/or their nominated representative to ensure compliance with this FMP. It is recommended that the filling material suppliers are issued with a copy of this FMP. The suppliers will be requested to provide supporting information and evidence to verify that the imported material complies with this FMP. The client has the right to make the final decision on the suitability of the material imported onto the site.

1.2 Site Overview

The site is located within Kemps Creek NSW, to support the application for existing part of Lot 15, Lot 16 & 17 of DP253503. The approximate 23 hectares (ha) is subject to the development application. The project development scope includes subdivision and subdivision works. The site boundaries and work areas are detailed in ***APPENDIX A – FIGURES.***

1.3 Legislation and Guidelines

Importation of materials onto the site must fully abide by the provisions of relevant legislative framework and guidelines that have been issued and/or endorsed by the NSW Environmental Protection Authority (EPA) under the following acts/regulations:

- Environmental Planning and Assessment Act 1979
- Protection of the Environment Operations Act 1997
- Contaminated Land Management Act 1997
- Schedule 3 of the State Environmental Planning Policy (State and Regional Development) 2011.

The relevant guidelines issued under the provisions of the aforementioned acts/ regulations include:

- Australian Standards AS3798: Guidelines on Earthworks for Commercial & Residential Developments (1998) [AS3798]
- Department of Land and Water conservation (DLWC) Site Investigations for Urban Salinity (2002)
- Guidelines for the NSW Site Auditor Scheme (3rd edition), NSW 2017
- Guidelines for consultants reporting on contaminated land, NSW EPA 2020
- Guidelines on the duty to report contamination under the contaminated land management act 1997, (2015)
- National Environmental Protection Measure (Assessment of site contamination), NEPM 2013
- NEPM (2013) "Schedule B(1) Guideline on the Investigation Levels for Soil and Groundwater"
- Excavated Natural Material Order 2014 (ENM 2014)
- Waste Classification Guidelines Part 1: Classifying Waste (NSW EPA, 2014a)
- PFAS National Environmental Management Plan (The Heads of EPAs Australia and New Zealand [HEPA], 2020).
- Protection of the Environment Operations (Waste) Regulation 2014 (NSW) – Relevant associated resource recovery orders and exemptions issued under part 9, Clause 91 and 92.

The following planning controls have also been taken into consideration for the preparation of this DSI:

- *SEPP (Industry and Employment) 2021*
- *Mamre Road Precinct DCP 2021*

2 Material Acceptance Criteria

Materials imported to the site must satisfy the minimum requirements detailed below. All materials to be imported must be accompanied by appropriate reports from qualified environmental consultants verifying the status of the material with respect to contamination.

All imported soil / rock material must be verified to be either VENM, ENM or other RRO as defined by the NSW Waste Classification Guidelines (NSW EPA 2014), current general resource recovery exemptions/orders or specific exemptions granted by the EPA, as defined above.

The generator of proposed imported fill material must provide the following by way of a Waste Classification Report prepared by a suitably qualified Environmental Consultant:

- The material source address;
- The material source site history and environmental setting;
- A detailed description of the material, including changes to material characteristics over depths, and estimated volume;
- Environmental setting (geology, potential acid sulfate soil, salinity) and potential impact from surrounds, including consideration of per- and poly-fluoroalkyl substances (PFAS);
- Civil Contractor, Haulage Contractor, Site Owner, and Material Owner details;
- Verification the material be either:
- Virgin excavated natural material (VENM);
- "Excavated natural material" used under the Resource Recovery Exemption - *The excavated natural material exemption 2014*;
- Other (Site Specific Resource Recovery Exemption (SSRRE) defined by the NSW Waste Classification Guidelines (NSW EPA 2014) refer to (Site Specific Resource Recovery Exemptions).

- ENM and other SSRRE must be sampled in strict accordance with the relevant Order.
- NOTE: All samples must be analysed at a National Association of Testing Authorities (NATA) accredited laboratory and follow the appropriate quality assurance/quality control (QA/QC) methods.
- VENM must include levels of sample analyses conducted at the acceptable sampling density outlined in Section 2.1 *VENM Acceptance Criteria*
- Verification the material is not or does not contain any of the unsuitable materials listed *2.5 Unsuitable* Materials.
- Verification the material is not from an unsuitable source site listed in *2.6 Unsuitable Source* Sites.
- Access to Redirect Recycling and/or their representatives to the source site for inspection and comparison sample collection.

As per HEPA (2018), screening for PFAS contaminated materials should be screened if:

- sourced from locations that historically or currently use or store PFAS-containing products, noting that all PFAS formulations should be considered (refer to Appendix B, HEPA (2018)) identified as a point source (e.g. firefighting training facilities, foam installations, metal plating works, electricity generation and/or distribution facilities
- identified as a secondary source (e.g., landfill, wastewater treatment facility and/or biosolids use site).

2.1 VENM Acceptance Criteria`

For VENM to be accepted, the concentrations of contaminants of potential concern (CoPCs) are to meet the relevant background ranges for metals adopted from *The Field Geologists Manual (3rd ed.)* (Berkman, 1989) and with respect to organic analytes, their analytical practical quantitation limits (see extract in ***Table 2***).

Table 2 Reference Acceptable Background Values for VENM.

Analytes	Site assessment criteria Berkmann (1989) Background Ranges[1]
Arsenic	1-50
Cadmium	1
Chromium (III) [2]	5-1,000
Copper	2-100
Lead	2-200
Mercury	0.03
Nickel	5-500
Zinc	10-300
Total Recoverable Hydrocarbons (TRH) Fraction C_6-C_{10} (F1)	< PQL [3]
TRH Fraction C_{10}-C_{16} (F2)	< PQL [3]
TRH Fraction C_{16}-C_{34} (F3)	< PQL [3]
TRH Fraction C_{34}-C_{40} (F4)	< PQL [3]
Organochloride Pesticides (OCPs)	< PQL [3]
Total Polychlorinated Biphenyls (PCBs)	< PQL [3]
Benzene	< PQL [3]
Toluene	< PQL [3]
Ethylbenzene	< PQL [3]
Xylenes (total)	< PQL [3]
Naphthalene	< PQL [3]
Benzo(a)pyrene	< PQL [3]
Total Polyaromatic Hydrocarbons (PAHs)	< PQL [3]

Notes to Table 2:

1. Background ranges, taken from the Field Geologist's Manual, compiled by D A Berkman, Third Edition 1989. Publisher – The Australasian Institute of Mining & Metallurgy (Berkman, 1989).
2. Concentrations reported as Chromium (total).
3. The analytical practical quantitation limits are used as the reference levels for VENM Assessment.

2.1.1 VENM Sampling Density and Analysis

Samples for the assessment of VENM for both stockpiles and in-situ material must be collected at the density specified within ***Table 1*** (further check sampling information is provided in ***APPENDIX B – SAMPLING DENSITIES*** within Table B1). Samples for in-situ material must be collected from the surface, and at depths where contamination is suspected. Additional samples should be collected if there is uncertainty in the data obtained and if further assessment is required.

Table 1 VENM Sampling Rate

Volume of Material to be Imported (m^3)	Samples Required
1,000	4
2,000	5
4,000	6
8,000	7
15,000	8
30,000	9
50,000	10

- **One additional sample required per additional 20,000 m^3.**
- **Further samples may be requested by an LOG-E representative following review of the information and/or evidence of potential contamination from neighbouring sites or identified areas of environmental concern.**
- **Stockpiles must be freshly excavated**

Discrete samples must be collected and submitted to a National Association Testing Authorities (NATA) accredited laboratory for the analysis of the following contaminants of potential concern:

- Heavy Metals (Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, and Zinc)
- Total Recoverable Hydrocarbons (TRHs)
- Benzene, Toluene, Ethyl-benzene, Xylene (BTEX)
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Polychlorinated Biphenyls (PCBs)
- Organochlorine Pesticides / Organophosphorus Pesticides (OCPs/OPPs)
- Potential Hydrogen (pH)
- PFAS
- Asbestos (presence/absence).

2.2 ENM Acceptance Criteria

The ENM acceptance criteria has been adopted directly from the ENM Order (2014) which has been provided in ***APPENDIX D – EXCAVATED NATURAL MATERIAL ORDER 2014.*** The sampling requirements including sampling density and analysis are provided in Tables 1, 2 and 3 of the ENM Order. Additional samples should be collected

if:

- there is uncertainty in the data obtained,
- if the source location is deemed at risk of PFAS contamination and
- if further assessment is required.

2.3 Topsoil Acceptance Criteria

Based on the information provided to ADE, if topsoil is to be imported in the future, it should contain Safety Data Sheet and should be from a reputable supplier.

2.4 Additional SSRREs

Any additional material subject to a SSRRE may be imported to the site, subject to an addendum to the site's FMP.

2.5 Unsuitable Materials

The materials are not, or do not contain any of the unsuitable materials listed below:

- Acid sulfate soils
- Asbestos
- Biocides
- Chemical storage containers
- Contaminated material
- Demolition rubble
- Excessively wet soils
- Explosives
- Fibro
- Food waste
- Fungicides
- Herbicides
- Vegetative waste
- Household domestic waste
- Large rock fragments
- Liquid Waste
- Metals
- Non-validated materials
- Oil filters and rags
- Paint
- Pesticides
- Plastics and PVC
- Radioactive waste
- Sanitary waste
- Timber (incl Treated)
- Tyres

2.6 Unsuitable Source Sites

- Known PFAS sites.
- Waste/ Resource recycling facilities (i.e., blended soil materials returned to market as ENM or recovered fines).
- Landfills.

3 Approval and Assessment

3.1 Approval of Source Site

Materials will be judged as suitable or otherwise by Stockland Development Pty Ltd and/or their representative based on the provided documentation, and the apparent reliability or otherwise of the documentation and its conformance with this FMP. Conformance will be determined as such:

1. An initial validation/classification report is submitted to the client's nominated environmental consultant, assigned unique identifier number (NBP code), and screened against the requirements of the FMP.
    a. For VENM, if material is deemed compliant with the FMP and the subject material is deemed low risk based on extensive prior analytical data / prior assessment of materials, no check sampling will be required unless otherwise requested by the client. **Proceed to step 2.**
    b. For ENM or if the subject material is deemed moderate to high risk, check sampling must be collected, unless otherwise requested by the client or the nominated environmental representative and analysed, via a NATA accredited laboratory, in accordance with the sample densities and analytes specified within **Table B1**. **Proceed to step 2.**
2. An upfront site inspection is to be conducted by the client or their nominated representative to document and visually assess the source materials and site conditions:
    a. Where the site inspection notes differing material descriptions or site conditions with potential for contamination, the client may request a site inspection/check sampling be carried out by their nominated environmental consultant.
3. Should the source site inspection and check sample results (if collected) be found to comply with the FMP, a memorandum of review (MOR) including details of the initial classification, source site inspection(s), check sampling results and any conditions of approval will be provided to the client as an approval to accept the material for import.

In situations where imported materials are deemed to be of low risk of contamination due to extensive prior investigations/analytical data, the client may elect not to proceed with check sampling for any site at its discretion.

If material being imported does not match the description within the approved classification report, then importation of material from source site will be stopped and deemed rejected until source site can verify/classify/justify material as being suitable for this FMP.

Any materials deemed 'not to comply' or 'yet to comply' with this protocol should not be imported onto the site. If doubt arises with respect to any materials already imported onto the site, the materials shall remain stockpiled, delineated, and signposted in a clearly defined area pending final assessment in order to maintain an exclusion zone to prevent cross contamination. If materials at the site are deemed unacceptable for use for the development works, a specific management plan for these materials should be developed by a suitably qualified environmental consultant and be either transported back to the source location, or further assessed from off-site disposal to an appropriately licenced receiving facility.

A decision-making flowchart is provided in ***APPENDIX E – FILL IMPORTATION APPROVAL FLOWCHART.***

3.2 Non-Compliance

Any material imported to site that is found to be non-compliant (discovered during check testing or during general site activities), or subject to be, will be isolated and assessed by the client and/or their representative. If the non-compliant material is found to be incompatible with the site, it will be removed at the cost of the source site and/or the importing contractor. The cost of remediation and validation will be borne by the source site and/or the importing contractor.

4 Record keeping and Chain of Responsibility

4.1 Gate Records

A record of truck movements should be maintained for trucks carrying material imported to the site providing the following information:

- The date and time of truck arrival
- The source location of the material
- Source site approval number (unique identification number confirming approved source)
- The truck registration details
- Material type
- The approximate volume of material per load
- Visual assessment of material at gate
- Record of load acceptance / rejection.

Materials not deemed consistent with the supporting documentation will be rejected from entering the site. Similarly, materials will be rejected if the volume exceeds that stated in the supporting documentation. A supplementary assessment may be made by the source site's consultant to allow for the additional volume; however, this must be submitted for review to the client prior to acceptance.

4.2 Filling Record

Following acceptance of the suitability of the materials and importation, accurate records must be maintained by the principal contractor regarding placement and use of the materials by the principal contractor. Written records must detail the location and depths of the fill placement, including any deviation from existing design plans and/or scope of works.

4.3 Chain of Responsibility

For the importation of fill materials, the chain of responsibility consists of the following:

- Supplier / generator
- Environmental consultant
- Principal contractor – TBC

4.3.1 Supplier / generator

The responsibilities of the supplier / generator include:

- Transportation and delivery of the appropriate fill materials
- Ensuring the fill materials are provided with a valid classification certificate.
- Only the suitable materials outlined in the accompanying classification certificate are being transported/provided.
- Keeping written records of all fill materials supplied

- Removal of material deemed to be non-compliant by the principal contractor following inspection and/or further assessment.

4.3.2 Environmental Consultant

The responsibilities of the environmental consultant nominated by the principal contractor include:

- Review of classification materials with decision to be made on the preliminary approval status of the fill materials according to the FMP and relevant guidelines outlined in section 2.
- Ensure that any inspections and/or check sampling requested by the client is undertaken as per the requirements of this FMP and relevant guidelines outlined in section 2.
- Report the findings of any inspections and/or check sampling events to the principal contractor in an appropriate time period including analytical data and comparison to the requirements outlined in the FMP.

4.3.3 Principal Contractor

The responsibilities of the principal contractor include:

- Provide the environmental consultant with classification reports prior to importation of fill materials.
- Keeping written records of all fill materials received, including accompanying classification certificates, volumes, and fill descriptions.
- Keeping written records of the placement of the fill materials
- Engagement of a suitably qualified environmental consultant as required.

5 References

- D A Berkman (1989), The Field Geologists Manual (3rd ed.).
- Environmental Planning and Assessment Act 1979.
- Protection of the Environment Operations Act 1997.
- Contaminated Land Management Act 1997.
- Schedule 3 of the State Environmental Planning Policy (State and Regional Development) 2011.
- Guidelines for the NSW Site Auditor Scheme (3rd edition), NSW 2017.
- Guidelines for consultants reporting on contaminated land, NSW EPA 2020.
- Guidelines on the duty to report contamination under the contaminated land management act 1997, (2015)
- National Environmental Protection Measure (Assessment of site contamination), NEPM 2013.
- NEPM (2013) "Schedule B(1) Guideline on the Investigation Levels for Soil and Groundwater".
- Excavated Natural Material Order 2014 (ENM 2014).
- Waste Classification Guidelines Part 1: Classifying Waste (NSW EPA, 2014a).
- *PFAS National Environmental Management Plan* (The Heads of EPAs Australia and New Zealand [HEPA], 2020).
- *Protection of the Environment Operations (Waste) Regulation 2014* (NSW) – Relevant associated resource recovery orders and exemptions issued under part 9, Clause 91 and 92.
- Sampling design part 1 - application Contaminated Land Guidelines, NSW EPA 2022.
- The excavated natural material exemption 2014 (NSW EPA, 2014).
- The excavated natural material order 2014 (NSW EPA, 2014).
- The Mulch Exemption 2016 (NSW EPA, 2016).
- The Mulch Order 2016 (NSW EPA, 2016).

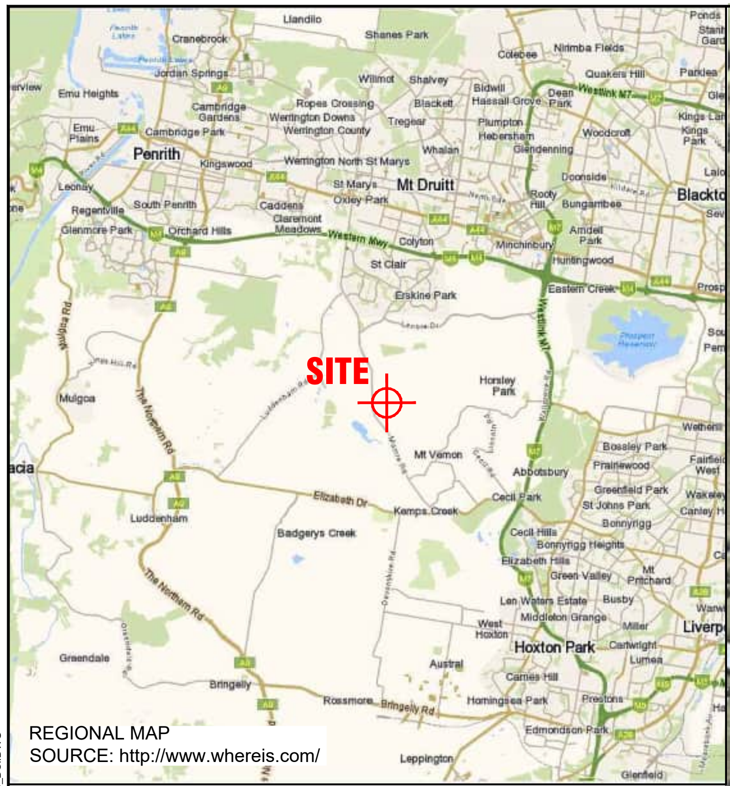
6 Limitations

This report has been prepared for use by Stockland Development Pty Ltd who have commissioned the works in accordance with the project brief only and has been based on information provided by the client. The advice herein relates only to this project and contents should be reviewed by a competent and experienced person with experience in said reports, before being used for any other purpose. ADE Consulting Group Pty Ltd (ADE) accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced or amended in any away without prior approval by the client or ADE and should not be relied upon by any other party, who should make their own independent enquiries.

This report does not provide an assessment of the environmental status of the site, and it is limited to the scope defined herein. ADE's professional opinions are based upon its professional judgment, experience, and training.

ADE has used a degree of care and skill ordinarily exercised in similar investigations by reputable members of the Environmental Industry within Australia. No other warranty, expressed or implied, is made or intended.

Appendix A - Figures



REGIONAL MAP
SOURCE: http://www.whereis.com/

LEGEND

SITE BOUNDARY

NOTE:
ALL LOCATIONS ARE APPROXIMATE
DIMENSIONS IN METRES.

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 03 MAR 2023.

PLOT DATE: 17/10/2023 2:36:22 PM DWG FILE: C:\USERS\MIRANDA.CHAU\ADE CONSULTING GROUP PTY LTD\ENV-WORKING - DOCUMENTS\NSW\PROJECT\23.0279.00 FIFE 270 ALDINGTON CONTAM + GEOTECH\6-WORKING DOCUMENTS\4-CAD (MC)\23.0279_DSI.DWG

revision	no.	description	drawn	approved	date
	A	FIRST ISSUE	MC	LL	17/10/23

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0 30 60 90 120 150
SCALE 1:3000 @A3 METRES

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scale	AS SHOWN
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client: FIFE LAND 2 PTY LTD AND STOCKLAND DEVELOPMENT PTY LTD

project: FILL MANAGEMENT PLAN
244-270 ALDINGTON ROAD, KEMPS CREEK, NSW

title: SITE LOCATION PLAN

project no: 23.0847 | figure no: FIGURE 1 | rev: A

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Appendix B - Sampling Densities

Table 3. Source Site Check Sampling and Analytical Requirements for ENM, VENM and SSRRM[4].

Filling / Material	Minimum sample number / frequency[4]	Minimum analyte suite to include[1,2]	Additional Analysis Required[2,3]
VENM	0 m^3 – 15,000 m^3 = 3 samples 15,001 m^3 – 50,000 m^3 = 5 samples For sites >50,000 m^3 and for sites which are irregular in shape (i.e., not a square site, a sampling program will be adopted on a case-by-case basis. With approval from the client prior to commencement of validation in such circumstances.	Heavy metals[2] PAHs TRH BTEX PCBs OCP / OPPs Asbestos (if present above VENM layer) Field oxidation and/or chromium reducible sulfur (CRS) (if within an area identified as higher risk for potential acid sulfate soils) pH PFAS	Any contaminant considered to be potentially present in the material based on site information
ENM	30% of sampling density outlined within the NSW ENM Order 2014 – refer to Appendix D	Heavy metals[2] Electrical conductivity pH PAHs TRH BTEX PCBs OCP / OPPs Asbestos Foreign materials (rubber, plastic, bitumen, paper, cloth, paint, and wood) Field oxidation and/or CRS (if within area of Potential Acid Sulfate Soils) PFAS	Any contaminant considered to be potentially present in the material based on site information
SSRRM	**Stockpiles:** 30% of sampling density outlined within the VIC EPA's Industrial Waste Resource Guidelines – Soil Sampling (IWRG702-2009) **In-situ:** 30% of sampling density outlined within the NSW EPA's Contaminated Sites – Sampling Design Guidelines (1995)	Heavy metals[2] PAHs TRH BTEX PCBs OCP / OPPs Asbestos Field oxidation and/or chromium reducible sulfur (CRS) (if within an area identified as higher risk for potential acid sulfate soils) PFAS	Any contaminant considered to be potentially present in the material based on site information

[1] Note: not all samples necessarily require testing for all analytes.
[2] Heavy metals = arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc. BTEX = benzene, toluene, ethylbenzene, xylenes. OCPs = organochlorine pesticides (a scheduled chemical). OPPs = organophosphate pesticides. PAH = polycyclic aromatic hydrocarbons. PCBs = polychlorinated biphenyls. TRH = total recoverable hydrocarbons. CRS = Chromium Reducible Sulfur.
[3] Based on advice from a suitably qualified environmental consultant.
[4] For special alignments such as large infrastructure tunnels, LOG-E and their nominated Environmental Consultant will consider the sampling density on a case-by-case basis.

Appendix C – Definitions

VENM Definition

The Protection of the Environment Operations Act (POEO Act) defines virgin excavated natural material (VENM) as:

''natural material (such as clay, gravel, sand, soil, or rock fines):

(a) That has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining, or agricultural activities and
(b) That does not contain any sulfidic ores or soils or any other waste.

and excludes excavated natural material that meets such criteria for virgin excavated natural material as may be approved for the time being pursuant to an EPA Gazettal notice.'

ENM Definition

Excavated natural material (ENM) is naturally occurring rock and soil (including material such as sandstone, shale, clay, and soil) that has:

a) Been excavated from the ground.
b) Contains at least 98 per cent (by weight) natural material.
c) Does not meet the definition of VENM.

ENM does not include material that has been processed or contains acid sulfate soils or potential acid sulfate soils.

Site Specific Resource Recovery Exemptions (SSRRE)

SSRRE contain the conditions that consumers must meet to use the resource recovery waste for application to land as fill. These conditions may include requirements regarding how to reuse or apply the waste, as well as record keeping, reporting and other requirements.

Site Specific Resource Recovery Orders (SSRRO)

SSRRO contain the conditions that generators and processors of waste must meet to legally supply the resource recovery waste material for land application. These conditions may include material specifications, processing specifications, record keeping, reporting and other requirements.

Topsoil

Topsoil material is the imported material from relevant supplier. It would consist of Safety Data Sheet to inform the use of material.

Appendix D – 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

***In Situ* Sampling at surface**				
Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
Size of *in situ* 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

***In Situ* Sampling at Depth**	
Column 1	**Column 2**
Sampling Requirements *	**Validation**
1 soil sample at 1.0 m bgl from each surface sampling point followed by 1 soil sample for every metre thereafter. 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.	Required if the depth of excavation is equal to or greater than 1.0 m bgl

* 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:

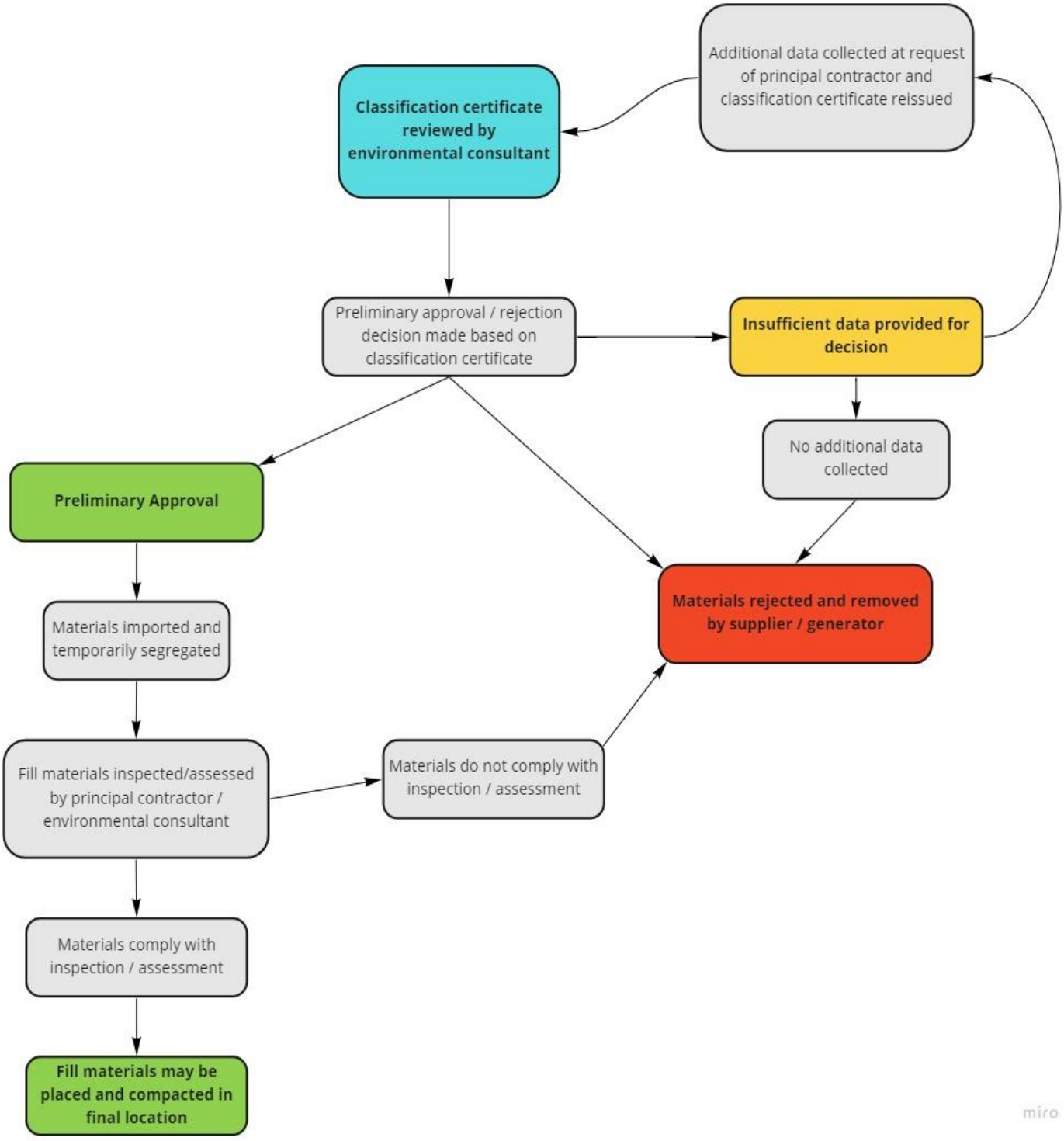
- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- 1 sample at 1.75 m bgl.
- No further depth sampling after 1.75 m bgl, unless required under section 4.4.4.

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.

Appendix E – Fill Importation Approval Flowchart


Additional data collected at request of principal contractor and classification certificate reissued
Classification certificate reviewed by environmental consultant
Preliminary approval / rejection decision made based on classification certificate
Insufficient data provided for decision
No additional data collected
Preliminary Approval
Materials rejected and removed by supplier / generator
Materials imported and temporarily segregated
Fill materials inspected/assessed by principal contractor / environmental consultant
Materials do not comply with inspection / assessment
Materials comply with inspection / assessment
Fill materials may be placed and compacted in final location
miro

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