

END-OF-WASTE CRITERIA FOR RECYCLED CONCRETE AGGREGATE

SINGLE CASE DECISION FOR ENVA IRELAND LIMITED

This document sets out end-of-waste criteria for
Recycled aggregate,
produced by ENVA Ireland Limited.

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Decision establishing End-of-Waste Criteria
under
Regulation 28 of the European Union (Waste Directive) Regulations 2011-2020
for
recycled aggregate
produced by
ENVA Ireland Limited,
Clonminan Industrial Estate
Portlaoise
Co. Laois.

Decision Date: 11th October 2022

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1 Introduction

This introduction is not part of the decision and does not purport to be a legal interpretation of the decision.

Article 6 of the Waste Framework Directive¹, 2008, as amended was transposed into Irish law by the European Union (Waste Directive) Regulations 2011-2020² (hereafter referred to as the Regulations). Article 6 (End-of-waste status) of the Waste Framework Directive 2008/98/EC as amended by Directive 2018/851, was transposed into Irish law via Part 3 Regulation 28 (End-of-waste) of the European Union (Waste Directive) Regulations 2011-2020. Regulation 28 of the Regulations assign responsibility to the Environmental Protection Agency to make certain decisions regarding end-of-waste.

End-of-waste is a means of determining the point at which, for the purposes of waste regulation, a material need no longer be classified as waste after it has undergone a recovery operation, including recycling, and complies with specific criteria developed in accordance with the specific conditions outlined in the Regulations. Compliance with the end-of-waste criteria, as outlined in this document, is sufficient to ensure that recycled aggregate may be used as a secondary material without the need for waste regulation or control. The recycled aggregate may be used as for the specific purposes detail in the end-of-waste criteria.

These end-of-waste criteria may be reviewed and updated by the Agency at any stage based on the experience of practical applications, technological developments or legislative amendments. The Agency reserves the right to depart from the position outlined and to take appropriate action to avoid overall adverse environmental or human health impacts.

If at any time the European Commission publishes generally applicable end-of-waste criteria for recycled aggregate, those European criteria may supersede these criteria and the Agency may withdraw this decision.

If at any time the Agency publishes generally applicable national end-of-waste criteria for recycled aggregate, those national criteria may supersede these criteria and the Agency may withdraw this decision.

These end-of-waste criteria are applicable in Ireland. End-of-waste compliant material can be placed on the export market where:

- approval has been attained from the destination country's relevant competent authority that this authority recognises the recovered material as a non-waste prior to the material being placed on that market;
- the National Transfrontier Shipments Office has been contacted and confirmation has been attained that they recognise this approval from another jurisdiction prior to the material being placed on that market; and
- record of the above approval(s) and confirmations are maintained and available for inspection at the Producer's facility.

¹ Waste Framework Directive - Directive 2008/98/EC on waste (WFD).

² Waste Directive Regulations - European Union (Waste Directive) Regulations 2011 – 2020

The material shall become waste again and subject to waste management controls if:

- any critical data in the approved batch record for the finished product is found to be false and the finished product does not meet the required finished product specification;
- the finished product is discarded or there is an intention or requirement to discard, for example if it is disposed of;
- it is stored for a period greater than may be specified in the end-of-waste criteria;
- it is mixed with other waste materials;
- the producer cannot provide documented evidence of compliance with these end-of-waste criteria;
- the producer cannot provide evidence that there is a sustained active market for the finished product;
- the producer cannot provide evidence that the requirements have been satisfied for the export market on which the finished produced has been placed; or
- if there is a requirement to recall the finished product from the market.

This decision document is for the purposes of Regulation 28 of the European Union (Waste Directive) Regulations 2011-2020 only and nothing in this document shall be construed as negating ENVA Ireland Limited or users' statutory obligations or requirements under any other authorisations (including planning permission), enactments or regulations.

The decision sets out in detail the end-of-waste criteria for the production of recycled aggregate by ENVA Ireland Limited.

2 Decision

The Agency has decided, in accordance with Regulation 28(3) of the European Union (Waste Directive) Regulations 2011-2020, that the recycled aggregate (as defined in Appendix 1) the subject of the application made by ENVA Ireland Limited (hereafter referred to as ENVA) on the 03rd February 2021, and produced at an appropriately authorised waste facility, will cease to be waste if it complies with the end-of-waste criteria set out in this document.

The Agency is satisfied, based on:

- the information provided by the applicant, including additional information;
- the fact that the recovered material will serve a useful purpose in continuing to replace the use of the primary raw material in construction;
- the fact that the recovered material will be required to comply with REACH requirements have an associated REACH registration and is required to meet all current product requirements prior to placing the material on the market;
- Applicable National Standards Authority of Ireland (NSAI) Standards including:
 - I.S. EN 13242: Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction, and several additional standards

which are cross referenced in this standard that are applicable to the production of recycled aggregate subject to its final use.

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- The Agency's June 2020 Draft Guidance on End-of-Waste;
- Joint Research Centre, 2009 Final Report on "End-of-waste criteria"; and
- Joint Research Centre, 2014 Study on methodological aspects regarding limit values for pollutants in aggregates in the context of the possible development of end-of-waste criteria under the EU Waste Framework Directive

that, subject to compliance with the requirements of this decision, the recycled aggregate conforms with the requirements of Regulation 28(1)(a) & 28(2) of the Regulations and its use will not lead to overall adverse environmental and human health impacts, if produced in a regulated production environment, the outputs of which meet the requirements of the relevant product legislation.

3 Materials Handling & Control

3.1 Waste Inputs

- 3.1.1 Inputs shall be restricted to concrete as per the List of Waste code:
 - 17 01 01 concrete (from construction and demolition waste)
- 3.1.2 Inputs shall meet the incoming waste acceptance criteria of the waste authorisation for the facility in which the material is produced.
- 3.1.3 Each load of waste input shall be assigned a unique identifier.
- 3.1.4 Where non-conforming waste is delivered, it shall be immediately moved to a designated quarantine area and stored pending consignment to the supplier or an appropriately authorised waste management facility.
- 3.1.5 An asbestos survey should be undertaken prior to any demolition activities from which input material is sourced. Any asbestos or asbestos containing material identified must be segregated and disposed of separately in accordance with National and European legislation. Asbestos and asbestos containing materials are not permitted in the input material, therefore records of inspection of asbestos surveys completed for the source sites shall be maintained.

3.2 Recovery Process

- 3.2.1 Recovery processes which are required in order to produce the recycled aggregate shall be completed in compliance with the waste authorisation for the facility in which the material is produced.
- 3.2.2 Other waste streams used as input shall, once received by the producer or importer, be kept permanently separate from contact with any other waste.

3.3 Quality of the recycled aggregate

3.3.1 The recycled aggregate shall comply with the relevant product technical standard(s), legislative requirements, and customer specification for its intended specific use.

As regulations are subject to amendment and replacement, it is the producer and user's responsibility to ensure that current regulations are referred to. As Standards are subject to regular review, it is the producer and user's responsibility to ensure that the latest version is referred to.

3.3.2 The relevant product technical standards for the recycled aggregate include, where applicable:

- IS EN 13242: Aggregates for unbound and hydraulically bound material for use in civil engineering works and road construction, and several additional standards which are cross referenced in this standard that are applicable to the production of recycled aggregate subject to its final use.

3.3.3 Each batch of the recycled aggregate shall be assigned a unique identifier. The recycled aggregate shall be tested, using an accredited test method, where available, and comply with the criteria set out in *Appendix 2*

3.3.4 Testing of the recycled aggregate shall be carried out in accordance with relevant technical standards, included in Appendix 2:

3.3.5 The recycled aggregate shall:

- i. comply with relevant provisions of the Classification, Labelling and Packaging (CLP) ³ Regulation;
- ii. comply with relevant provisions of the Construction Product Regulations (CPR)⁴
- iii. comply with relevant provisions of the REACH Regulation⁵; and
- iv. comply with relevant provisions of the Persistent Organic Pollutants (POPs) Regulation⁶.

3.3.6 The recycled aggregate shall comply with physical contamination limits (Total Content Criteria) as specified in Appendix 3.

3.3.7 The recycled aggregate shall not be stored for a period greater than 24 months. Products that exceed the time limit for storage shall be tested again to demonstrate the material does not exceed the pollutant limit values, before leaving the waste authorised site. Any recycled aggregate that exceeds the pollutant limit values shall be deemed to be waste.

³ Classification, Labelling and Packaging - Regulation (EC) No 1272/2008 (CLP)

⁴ Construction Product Regulation (CPR) (EU No305/2011)

⁵ Registration, Evaluation, Authorisation and Restriction of Chemicals - Regulation 1907/2006/EC (REACH)

⁶ Persistent Organic Pollutants - Regulation 850/2004/EC (POPs)

3.4 Quality Management System

- 3.4.1 The producer shall, introduce, maintain and implement a quality management system and Quality Protocol to demonstrate compliance with the end-of-waste criteria.
- 3.4.2 The quality management system shall be independently certified by a body accredited by the Irish National Accreditation Board.

4 Demonstrating compliance with the decision establishing end-of-waste criteria

ENVA shall demonstrate compliance with the requirements of this decision and if unable to do so the recycled aggregate will be considered a waste.

4.1 Records Management

To demonstrate compliance with these end-of-waste criteria, the following records of production, testing and use, sale or supply of the recycled aggregate shall be maintained;

- 4.1.1 The quality management system, set out in *Criterion 3.4*, shall include a set of documented procedures concerning each of the following aspects:

- i. visual inspection of the input waste to establish the content and nature of any contaminant components. The procedure shall include:
 - a) the steps involved in the visual inspection of the input waste;
 - b) the process for determining whether the washing step is required within the recovery process;
 - c) the process for determining whether material is non-conforming; and
 - d) visual inspection frequency;
- ii. sampling and testing/analysis of the output material (recycled aggregate) to establish the content and nature of any contaminant components and monitor the quality of the output resulting from the recovery operation. The procedure shall include:
 - a) the types of testing for the product;
 - b) the process for determining sampling frequencies; and
 - c) sampling and testing frequency;
- iii. monitoring of the recovery processes and techniques;
- iv. acceptance control of waste used as input for the recovery operation;
- v. feedback from customers concerning the product quality;
- vi. record keeping of the results of monitoring conducted under points (i) to (v);
- vii. review and improvement of the quality management system;
- viii. training of staff;
- ix. specific monitoring requirements set out for each criterion;

- x. compliance with the relevant product technical standards, including certification at the appropriate attestation level.
 - xi. Compliance with relevant legislative requirements and customer specifications;
 - xii. use, control, calibration and maintenance of inspection, measuring and test equipment. Equipment shall be uniquely identified; and
 - xiii. identification and management of non-conforming recycled aggregate.
- 4.1.2 Training records shall be maintained which demonstrate that all relevant persons have been appropriately trained in all aspects of these criteria, including the relevant product technical standard(s), legislative requirements.
- 4.1.3 In order to demonstrate that the recycled aggregate does not pose a risk to the environment or human health, the producer shall make available;
- i. the results of any testing/analysis carried out;
 - ii. interpretative reports including laboratory results;
 - iii. details of the test methods used;
 - iv. details of accreditation of the test method;
 - v. details of accreditation of laboratory, where appropriate;
 - vi. independent audit reports demonstrating the outcome of any independent audit of the waste recovery processing shall be made available for inspection; and
 - vii. if contaminants above the allowable limits are identified, details of the actions taken to correctly dispose of the non-conforming load(s) and corrective action(s) taken prior to dispatch and to prevent any such recurrence.
- 4.1.4 A register of non-conforming products for these criteria shall be maintained. The register shall contain information as to the reasons for the non-conformance and the manner in which the non-conformance was rectified. The register shall also include information on the outlet for the non-conforming product, for example whether it is re-introduced to the start of the process, disposed of, or recovered as waste.
- 4.1.5 A 'Statement of conformity' shall be completed for each consignment of recycled aggregate leaving the facility or being used for the first time. The statement of conformity shall;
- i. include the producer of the recycled aggregate details;
 - ii. state the customer's name and contact details;
 - iii. state the relevant provisions of the appropriate product technical standard(s) to which the recycled aggregate has been complied with. Details of the name of the specific standard(s) and specification(s) which are being applied are to be included;
 - iv. state the quantity of the consignment in kg;
 - v. include a product description and the unique identifier for each batch included in the consignment;

- vi. include a statement that the consignment meets the criteria referred to in this decision (End-of-waste Decision ART28-0059).
- vii. include a statement that: *'The material in this consignment is not classified as hazardous, following the definitions in Article 3 and Annex I of Regulation EC/1272/2008 (CLP), and meets the prescriptions on commercialisation of substances of very high concern (SVHC) laid out in Article 56 of Regulation EC/1907/2006 REACH, and the restriction of the commercialisation of persistent organic pollutants laid out in Article 3 of Regulation 50/2004/EC (POPs)';*
- viii. include a section on the intended use with the statement that: *The material in this consignment is intended exclusively for use in earthworks including road construction, general use as surface dressing, general fill, and forestry road construction*
- ix. state any restrictions on use;
- x. state the date of supply;
- xi. be issued in electronic form;
- xii. be issued prior to the recycled aggregate leaving the facility or being used for the first time;
- xiii. be accompanied by or contain a link to an electronic copy of the safety data sheet for the recycled aggregate; and
- xiv. shall be signed and dated by the producer/importer of the recycled aggregate certifying that the above information is complete and correct.

4.1.6 The producer or the importer shall transmit the statement of conformity to the next holder of the consignment. They shall retain a copy of the statement of conformity for at least one year after its date of issue.

4.1.7 The producer shall maintain documentary evidence, for assessment by the relevant competent authority which demonstrates compliance, where appropriate, with the provisions of the POPs Regulation, CLP Regulation, REACH Regulation, and Construction Product Regulation (CPR) as required. The producer shall ensure these matters are addressed in customer supply contracts.

4.1.8 All records including controls, inspections and training shall be maintained for a minimum of 5 years.

4.1.9 Records including any electronic media shall be stored and maintained in a manner that they are readily retrievable and protected against damage, deterioration or loss. Records shall be legible, identifiable and traceable to the process or product. All reviews and revisions of procedures shall be included in an annex to the most up to date version of that procedure.

4.1.10 The producer shall, upon request, provide competent authorities including the Agency, the NSAI, the relevant local authorities, the Health and Safety Authority (HSA), the National Trans-frontier Shipments of Waste Office, Market Surveillance Authority and the Competent National Authority access to the quality management system, including statements of conformity.

5 Use and Restrictions on Use

Users of the recycled aggregate that are produced in compliance with these criteria shall take full account of any environmental impact resulting from such use.

The recycled aggregate produced can be placed on the market for use in earthworks including road construction, general use as aggregate in surface dressing, general fill, and forestry road construction.

To comply with these criteria, the following restrictions apply:

- The recycled aggregate will not be in contact with groundwater or surface water
- The use of bedding pipe material is restricted to solid pipe only
- The use of the recycled aggregate in bound applications will not be permitted in construction works⁷ or part thereof, where the performance of the bound application has an effect on the performance on the construction works in terms of its basic requirements.
- Recycled aggregate shall not be used as unbound granular fill (hardcore) for use under concrete floors and footpaths⁸
- The recycled aggregate is limited to sale and use in the Republic of Ireland and in any other destination country where approval has been attained from the country's relevant competent authority that the recovered material is recognised by the competent authority in that jurisdiction as a non-waste prior to the material being placed on that market.

These criteria do not affect the obligation of the producer to hold and comply with a waste collection permit, certificate of registration, waste facility permit or waste/industrial emissions licence or any other National or European legislation which may apply when transporting, storing or processing waste. These criteria do not affect permitting or any other legal requirements that do not depend on the status of the material as a waste.

⁷ 'Construction Works' has the meaning assigned in Regulation (EU) No 305/2011 of the European Parliament And Of The Council laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

⁸ As required under Annex E of S.R. 21:2014+A1:2016

Appendix 1: Glossary of Terms

Aggregate	A granular material used in construction
Applicant	ENVA Ireland Limited, Clonminan Industrial Estate Portlaoise County Laois
Authorised waste facility	A facility which has been granted a waste authorisation in the form of an Industrial Emissions licence, a waste licence, a waste facility permit or a certificate of registration.
Batch	Quantity of material regarded as a single unit and having a unique reference.
CLP Regulation	Classification, Labelling and Packaging: Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006
Construction Product Regulations	Construction Product Regulations 2013 (S.I. No. 225 of 2013) transposed the EU Regulation No. 305/2011 into Irish Law. The regulation lays down harmonised conditions for the marketing of construction products across Member States of the European Union.
Consignment	Each load of recycled aggregate that leaves the facility or is being used for the first time. A consignment will be made up of batches.
Statement of Conformity	A declaration that the recycled aggregate conforms to end-of-waste criteria, product standards and specifications, it includes details of restriction on use of recycled aggregate
Factory Production Control	A management system focusing mainly on the production process which aims to ensure that product quality is consistently maintained to the required specifications.
Groundwater	Means all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.
Hazardous Waste	As defined in the Waste Management Act 1996, as amended.
Non-conforming product	A product that does not meet the requirements of the product technical standard(s), legislative requirements or these end-of-waste criteria, as appropriate.
Producer	Enva Ireland Limited, Clonminan Industrial Estate Portlaoise County Laois

POPs Regulation	Regulation (EC) No. 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC, as amended by Council Regulation (EC) No. 1195/2006, Council Regulation (EC) No. 172/2007, Commission Regulation (EC) No. 323/2007 6 and Commission Regulation (EC) No. 304/2009.
REACH Regulation	Regulation (EC) No. 1907/2006/EC concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.
Recovery	As defined in the Waste Management Act 1996, as amended.
Recycled aggregate	Recycled aggregate that meets these end-of-waste criteria
Recycling	As defined in the Waste Management Act 1996, as amended.
Surface water	Means inland waters, except groundwater, transitional waters and coastal waters, except in respect of chemical status for which it shall also include territorial waters
Statement of Conformity	A statement/declaration that the final product conforms to end-of-waste criteria, product standards and specifications, it includes details of restrictions on use of the recycled aggregate.
User	User means manufacturers, supply companies, contractors and all those organisations or individuals responsible for the end use of the product.
Waste	As defined in the Waste Management Act 1996, as amended.

Appendix 2: Standards, specifications, and Quality Control (Output Material)

The producer must comply with criteria set out in this document, including specifications below and/ or any other customer specifications, relating to the use of the output material (recycled aggregate) at the time it is produced: It is noted that some standards may have been withdrawn or be withdrawn in the future and the operator shall ensure the current standard is complied with.

Standards, specifications, and quality controls for the use of aggregates:

Product Use and Standard		Specification	Quality Controls
1. Unbound recycled aggregate: Pipe bedding	IS EN 13242: Aggregates for bound and hydraulically bound materials for use in civil engineering work and road construction	TII-Specification for Road Works Series 500- Drainage and Service Ducts (including Erratum No.1 dated 2009) https://www.tiipublications.ie/library/CC-SPW-00500-03.pdf	Compliance with TII SRW IS EN 13242- Conformance to the relevant section as required by the specification.
2. Unbound recycled aggregate: Granular fill, General fill, Capping.	IS EN 13242: Aggregates for bound and hydraulically bound materials for use in civil engineering work and road construction	TII-Specification for Road Works Series 600- Earthworks (including Erratum No.1, dated June 2013). https://www.tiipublications.ie/library/CC-SPW-00600-03.pdf	Compliance with TII SRW IS EN 13242- Conformance to the relevant section as required by the specification.
3. Unbound recycled aggregate: Unbound and cement bound mixtures	IS EN 13242: Aggregates for bound and hydraulically bound materials for use in civil engineering work and road construction	TII-Specification for Road Works Series 800- Road pavements- Unbound and cement bound mixtures (including Erratum No.1 dated 2013) https://www.tiipublications.ie/library/CC-SPW-00800-04.pdf	Compliance with TII SRW IS EN 13242- Conformance to the relevant section as required by the specification.
4. Unbound recycled aggregate	IS EN 13242: Aggregates for bound and hydraulically bound materials for use in civil engineering work and road construction	TII-Specification for Road Works Series-900- Road Pavements-Bituminous Bound Materials. https://www.tiipublications.ie/library/CC-SPW-00900-09.pdf	Compliance with TII specification. IS EN 13242- Conformance to the relevant section as required by the specification.

The NSAI also publishes guidance documents that interprets how the EN standard is applied in an Irish context:

- Standard Recommendation (SR)21: Guidance on the use of IS EN 13242+ AI:2007 – Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction

Summary of testing requirements and frequencies for standards and end uses:

End Use Specifications	Standard	Test	BS Test Reference	Minimum Test Frequency
All end uses	IS EN 13242 IS EN 12620	Particle size distribution (PSD)	EN 933-1	1 per week
		Particle Density	EN 1097 -6	1 per month
		Resistance to fragmentation Los Angeles Abrasion Value (LAAV)	EN 1097-2	2 per year
		Classification of constituents (see table B3 of Factory Production Control)	EN933-11	1 per month
		Water soluble sulphate	EN1744-1	1 per month
Aggregates for concrete	IS EN 12620	Particle density and water absorption	1097-6	1 per month
		Sulphur containing compounds	EN 1744-1	2 per year
		Chlorides	EN 1744-5	2 per year
		Influence on setting time of cement	EN 1744-6	2 per year

Note: It is the responsibility of the producer and users to ensure that testing is carried out in accordance with relevant technical standards where applicable, and that the most up to date version is being considered.

Appendix 3: Sample analysis

The producer must comply with criteria set out in this document, including specifications and pollutant limits specified below for the output (recycled aggregate) at the time it is produced:

Note: Leachate analysis for the below pollutant limit parameters shall be carried out a frequency of once per month. The frequency may be reduced subject to consistency of results over a 12-month period.

Pollutant limit values for the recycled aggregate:

Parameter	Proposed pollutant limit values Mg/kg dw LS/10
Antimony	0.09
Arsenic	0.09
Barium	7.3
Chromium	0.4
Molybdenum	0.6
Chloride	870
Selenium	0.1
Sulphate	1,600

Total Content (physical contaminant) Criteria for the recycled aggregate:

Materials	Proposed
Total Sulphur (s) %	1%
Mineral Oil	500 mg/kg
Floating Materials	5-10cm ¹ /kg ²
Metals	1% ¹
Soils	1% ¹
Gypsum	1% ¹
Wood	1% ¹
Plastic	1% ¹
Rubber	1% ¹

Note 1: by mass

Note 2: Aggregates for concrete and unbound, respectively