EN 15804+A2 EPD

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2.
Owner of the Declaration – IMS Site Services Limited t/a Greenstone Recycling

Declaration number: EPDIE-24-138
Issue date 21st August 2024
Valid to 20th August 2029

EPD Programme - EPD Ireland
Programme Operator - Irish Green Building Council
www.epdireland.org

Recovered Aggregate and Sand

10 mm graded aggregate (EN13242 & EN12620)
20 mm graded aggregate (EN13242 & EN12620)
40 mm graded aggregate (EN13242)
0-2 mm fine sand (EN13242 and EN12620)
0-4 mm coarse sand (EN13242 and EN12620)

1. General information

PROGRAMME OPERATOR	OWNER OF DECLARATION
Irish Green Building Council 19 Mountjoy Square, Dublin D01 E8P5 info@igbc.ie	IMS Hollywood Hollywood Great, Nag's Head, Naul Co. Dublin, Ireland
DECLARATION NUMBER	**PRODUCTION SITE**
EPDIE-24-138	IMS Hollywood Hollywood Great, Nag's Head, Naul Co. Dublin, Ireland
ECO PLATFORM EPD	**DECLARED UNIT**
Yes	1 tonne of recycled aggregate/sand
APPLICABLE PRODUCT CATEGORY RULES	**DECLARED PRODUCT**
1. CEN Standard EN 15804:2012+A2:2019 serves as core PCR 2. PCR - Part A Implementation and use of I.S. EN 15804:2012+A1 and + A2, and CEN TR 16970:2016 in Ireland for the development of Environmental Product Declarations (issued 17.08.2021), Version 2.0	One tonne of recycle aggregate/sand of the following designations: 10 mm graded aggregate (EN13242 & EN12620) 20 mm graded aggregate (EN13242 & EN12620) 40 mm graded aggregate (EN13242) 0-2 mm fine sand (EN13242 and EN12620) 0-4 mm coarse sand (EN13242 and EN12620)
DATE OF ISSUE	**SCOPE OF EPD**
21st August 2024	Cradle to gate with modules, A4, A5, C1–C4 and module D
DATE OF EXPIRY	**LCA CONSULTANT OR PERSON RESPONSIBLE FOR LCA**
20th August 2029	Ecoreview, Kilkenny, Ireland. +353 (087) 258 9783 www.ecoreview.ie
TYPE OF EPD: SINGLE OR MULTI PRODUCT	**LCA SOFTWARE AND DEVELOPER IF APPLICABLE**
Single product EPD, with different designations	Ecochain version 3.4.1
PRODUCT CLASSIFICATION OR NACE CODE	**NAME AND VERSION OF INVENTORY USED**
NACE 3832	Ecoinvent version 3.8
COMPARABILITY	
Environmental Product Declarations from different programmes may not be directly comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See clause 5.3 of EN 15804:2012+A2:2019	
The CEN Norm /EN 15804 serves as the core PCR	
Independent verification of the declaration according to ISO 14025	

Internally ☐ Externally ✕

SIGNATURE OF PROGRAMME OPERATOR	SIGNATURE VERIFIER
Pat Barry - CEO - Irish Green Building Council  IGBC IRISH GREEN BUILDING COUNCIL	Jane Anderson, ConstructionLCA Ltd  ConstructionLCA

2. Scope and Type of EPD

Scope

This EPD is Cradle to gate with modules, A4, A5, C1–C4 and module D. The Modules that are declared are shown in the table below.

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse – Recovery – Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
MDT	MDT	MDT	OP	OP	OP	OP	OP	OP	OP	OP	OP	MDT	MDT	MDT	MDT	MDT

X = Module declared; ND = Module not declared; MDT = Mandatory; OP = Optional.

Declared Functional Unit

One tonne (1,000kg) of recycled aggregate/sand of the following designations:
10 mm graded aggregate (EN13242 & EN12620)
20 mm graded aggregate (EN13242 & EN12620)
40 mm graded aggregate (EN13242)
0-2 mm fine sand (EN13242 and EN12620)
0-4 mm coarse sand (EN13242 and EN12620)

System Boundaries

The system boundaries are as illustrated in the table above.

In this EPD, two different C1-C4 and D scenarios are reported on. These two scenarios, A and B, are:
A. All the material is recycled (100% recycled)
B. All the material is landfilled (100% landfilled)

The impacts of Scenario A and Scenario B are reported seperately in two sets of impact tables in this EPD.

3. Detailed product description

The material components are aggregates and sands arising from construction and demolition wastes, and non-hazardous soil and granular excavation waste. The materials produced are aggregates and fine to coarse sands, for use as aggregates. this covers the following product designations:
10 mm graded aggregate (EN13242 & EN12620)
20 mm graded aggregate (EN13242 & EN12620)
40 mm graded aggregate (EN13242)
0-2 mm fine sand (EN13242 and EN12620)
0-4 mm coarse sand (EN13242 and EN12620)

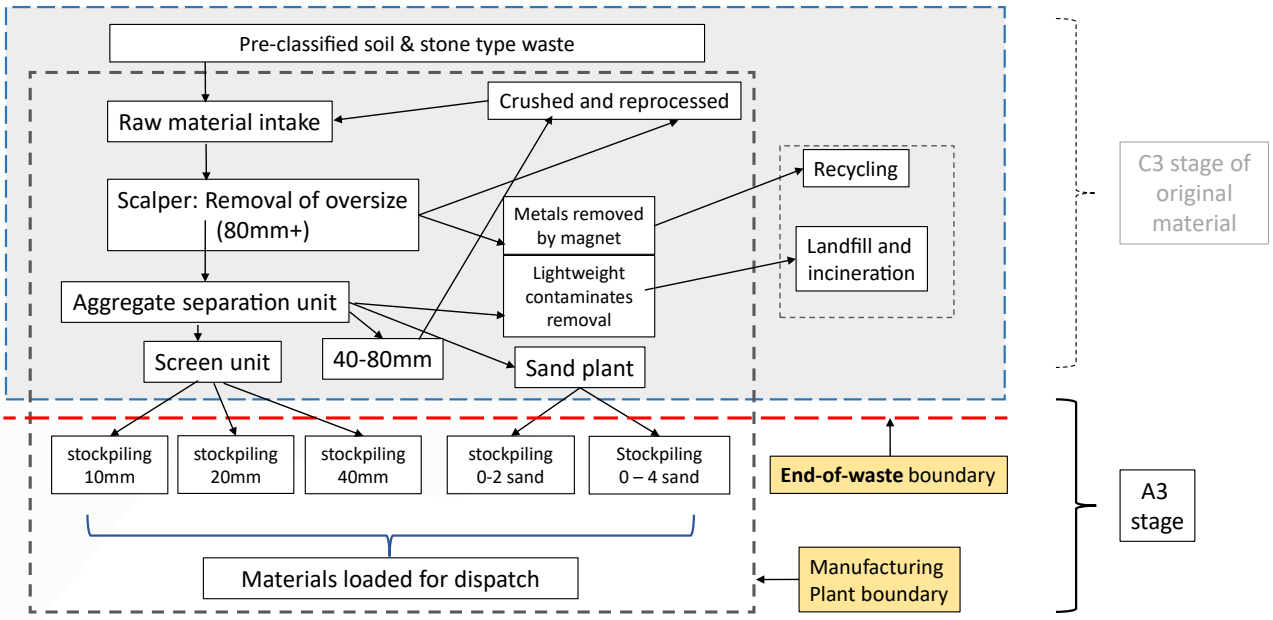
The recycled aggregates are manufactured to comply with EN 13242:2013 Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction, and EN 12620:2013 Aggregates for concrete. The aggregate and sands have a typical bulk density in the order of 1,500 kg/m3.

3.1 Manufacturing Process Description

Construction and demolition wastes is delivered to the aggregate recovery plant. Material is fed through a screener to remove oversize material. After going through the screener, the material is either sent forward to the aggregate separation (sorting) unit, or further screened. Removed metallic material is sent off-site for recycling.

After the screening and separation process, the materials are separated into the various fractions. A further process treats the process water to flocculate and settle out silt/clay from the process water in a closed loop system.

The end-of-waste state of the raw material, i.e. the demolition waste, is reached when it has been converted to aggregates that meet the requirement set out in the EPA end-of-waste decision [7]. Thus the material has reached the end of waste state when it is stockpiled for dispatch from the Integrated Materials Solutions site for use in the market. At this point, the raw aggregates are burden-free. The only impact allocated to the aggregates is the fuel used in stockpiling at the IMS site, as illustrated below.



IMS Aggregates/Sands

Scenario A, 100% recycling

4.1.A. LCA results - IMS Aggregates/Sands (Scenario A, 100% recycling)

Core Environmental impact per one tonne of aggregate/sand

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	0.00E+00	0.00E+00	2.05E-01	2.05E-01	3.39E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	9.93E-01	8.15E+00	9.79E+00	0.00E+00	0.00E+00
GWP-fossil	[kg CO_2 eq.]	0.00E+00	0.00E+00	2.05E-01	2.05E-01	3.39E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	9.93E-01	8.14E+00	9.74E+00	0.00E+00	0.00E+00
GWP-biogenic	[kg CO_2 eq.]	0.00E+00	0.00E+00	7.70E-05	7.70E-05	3.09E-03	0.00E+00	MND	MND	MND	MND	MND	MND	MND	3.73E-04	7.42E-03	3.87E-02	0.00E+00	0.00E+00
GWP-luluc	[kg CO_2 eq.]	0.00E+00	0.00E+00	2.05E-05	2.05E-05	1.35E-03	0.00E+00	MND	MND	MND	MND	MND	MND	MND	9.91E-05	3.26E-03	1.42E-02	0.00E+00	0.00E+00
ODP	[kg CFC-11 eq.]	0.00E+00	0.00E+00	4.39E-08	4.39E-08	7.85E-07	0.00E+00	MND	MND	MND	MND	MND	MND	MND	2.12E-07	1.89E-06	1.70E-06	0.00E+00	0.00E+00
AP	[mol H+ eq.]	0.00E+00	0.00E+00	2.13E-03	2.13E-03	9.62E-03	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.03E-02	2.31E-02	7.86E-02	0.00E+00	0.00E+00
EP-freshwater[1]	[kg P eq.]	0.00E+00	0.00E+00	6.80E-07	6.80E-07	2.42E-05	0.00E+00	MND	MND	MND	MND	MND	MND	MND	3.29E-06	5.81E-05	1.97E-04	0.00E+00	0.00E+00
EP-marine	[kg N eq.]	0.00E+00	0.00E+00	9.44E-04	9.44E-04	1.91E-03	0.00E+00	MND	MND	MND	MND	MND	MND	MND	4.57E-03	4.59E-03	2.91E-02	0.00E+00	0.00E+00
EP-terrestrial	[mol N eq.]	0.00E+00	0.00E+00	1.03E-02	1.03E-02	2.13E-02	0.00E+00	MND	MND	MND	MND	MND	MND	MND	5.01E-02	5.12E-02	3.19E-01	0.00E+00	0.00E+00
POCP	[kg NMVOC eq.]	0.00E+00	0.00E+00	2.85E-03	2.85E-03	8.19E-03	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.38E-02	1.97E-02	8.87E-02	0.00E+00	0.00E+00
ADP-minerals&metals[2]	[kg Sb eq.]	0.00E+00	0.00E+00	2.82E+00	2.82E+00	5.14E+01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.36E+01	1.23E+02	1.47E+02	0.00E+00	0.00E+00
ADP-fossils[2]	[MJ] ncv	0.00E+00	0.00E+00	1.06E-07	1.06E-07	1.20E-05	0.00E+00	MND	MND	MND	MND	MND	MND	MND	5.11E-07	2.89E-05	2.51E-05	0.00E+00	0.00E+00
WDP[2]	m^3 world eq. deprived	0.00E+00	0.00E+00	4.40E-03	4.40E-03	1.56E-01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	2.13E-02	3.76E-01	2.10E+00	0.00E+00	0.00E+00

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels (GWP-fossil; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossils = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

[2]The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

ND = Module not declared; INA = Indicator not assessed.

4.1.B. LCA results - IMS Aggregates/Sands (Scenario A, 100% recycling)

Resource use per one tonne of aggregate/sand

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	0.00E+00	0.00E+00	1.58E-02	1.58E-02	7.34E-01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	7.66E-02	1.76E+00	5.90E+00	0.00E+00	0.00E+00
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	0.00E+00	0.00E+00	1.58E-02	1.58E-02	7.34E-01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	7.66E-02	1.76E+00	5.90E+00	0.00E+00	0.00E+00
PENRE	[MJ]	0.00E+00	0.00E+00	2.99E+00	2.99E+00	5.45E+01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.45E+01	1.31E+02	1.56E+02	0.00E+00	0.00E+00
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	0.00E+00	0.00E+00	2.99E+00	2.99E+00	5.45E+01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.45E+01	1.31E+02	1.56E+02	0.00E+00	0.00E+00
SM	[kg]	1.00E+03	0.00E+00	0.00E+00	1.00E+03	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	0.00E+00	0.00E+00	1.61E-04	1.61E-04	5.81E-03	0.00E+00	MND	MND	MND	MND	MND	MND	MND	7.77E-04	1.40E-02	6.31E-02	0.00E+00	0.00E+00

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water.

ND = Module not declared; INA = Indicator not assessed.

4.1.C. LCA results - IMS Aggregates/Sands (Scenario A, 100% recycling)

Output flows and waste categories per one tonne of aggregate/sand

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	0.00E+00	0.00E+00	7.71E-06	7.71E-06	1.34E-04	0.00E+00	MND	MND	MND	MND	MND	MND	MND	3.73E-05	3.22E-04	2.82E-04	0.00E+00	0.00E+00
NHWD	[kg]	0.00E+00	0.00E+00	3.76E-03	3.76E-03	2.69E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.82E-02	6.46E+00	1.39E+02	0.00E+00	0.00E+00
RWD	[kg]	0.00E+00	0.00E+00	1.94E-05	1.94E-05	3.47E-04	0.00E+00	MND	MND	MND	MND	MND	MND	MND	9.40E-05	8.34E-04	8.38E-04	0.00E+00	0.00E+00
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	8.75E+02	0.00E+00	0.00E+00	8.75E+02	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

ND = Module not declared; INA = Indicator not assessed.

4.1.D. LCA results - IMS Aggregates/Sands (Scenario A, 100% recycling)

Additonal Environmental impact per one tonne of aggregate/sand

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Disease incidence	0.00E+00	0.00E+00	5.71E-08	5.71E-08	2.72E-07	0.00E+00	MND	MND	MND	MND	MND	MND	MND	2.76E-07	6.54E-07	9.13E-06	0.00E+00	0.00E+00
IRP[1]	kBq U235 eq	0.00E+00	0.00E+00	1.20E-02	1.20E-02	2.23E-01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	5.80E-02	5.36E-01	6.20E-01	0.00E+00	0.00E+00
ETP-fw[2]	CTUe	0.00E+00	0.00E+00	1.65E+00	1.65E+00	4.03E+01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	7.97E+00	9.69E+01	1.30E+02	0.00E+00	0.00E+00
HTP-c[2]	CTUe	0.00E+00	0.00E+00	6.37E-11	6.37E-11	1.30E-09	0.00E+00	MND	MND	MND	MND	MND	MND	MND	3.08E-10	3.12E-09	4.39E-09	0.00E+00	0.00E+00
HTP-nc[2]	CTUe	0.00E+00	0.00E+00	1.19E-09	1.19E-09	4.07E-08	0.00E+00	MND	MND	MND	MND	MND	MND	MND	5.78E-09	9.79E-08	8.84E-08	0.00E+00	0.00E+00
SQP[2]	dimensionless	0.00E+00	0.00E+00	3.58E-01	3.58E-01	3.58E+01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.73E+00	8.60E+01	1.25E+02	0.00E+00	0.00E+00

PM = Potential incidence of disease due to PM emissions, IRP = Potential Human exposure efficiency relative to U235, ETP-fw = Potential Comparative Toxic Unit for ecosystems; HTP-c:Potential Comparative Toxic Unit for humans, HTP-nc = Potential Comparative Toxic Unit for humans, SQP = Potential soil quality index.

[1] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuelcycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

[2] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

ND = Module not declared; INA = Indicator not assessed.

IMS Aggregates/Sands

Scenario B, 100% recycling

4.1.A. LCA results - IMS Aggregates/Sands (Scenario B, 100% landfilled)

Core Environmental impact per one tonne of aggregate/sand

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	0.00E+00	0.00E+00	2.05E-01	2.05E-01	3.39E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	9.93E-01	8.15E+00	0.00E+00	1.06E+01	0.00E+00
GWP-fossil	[kg CO_2 eq.]	0.00E+00	0.00E+00	2.05E-01	2.05E-01	3.39E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	9.93E-01	8.14E+00	0.00E+00	1.05E+01	0.00E+00
GWP-biogenic	[kg CO_2 eq.]	0.00E+00	0.00E+00	7.70E-05	7.70E-05	3.09E-03	0.00E+00	MND	MND	MND	MND	MND	MND	MND	3.73E-04	7.42E-03	0.00E+00	8.46E-02	0.00E+00
GWP-luluc	[kg CO_2 eq.]	0.00E+00	0.00E+00	2.05E-05	2.05E-05	1.35E-03	0.00E+00	MND	MND	MND	MND	MND	MND	MND	9.91E-05	3.26E-03	0.00E+00	1.07E-02	0.00E+00
ODP	[kg CFC-11 eq.]	0.00E+00	0.00E+00	4.39E-08	4.39E-08	7.85E-07	0.00E+00	MND	MND	MND	MND	MND	MND	MND	2.12E-07	1.89E-06	0.00E+00	3.20E-06	0.00E+00
AP	[mol H+ eq.]	0.00E+00	0.00E+00	2.13E-03	2.13E-03	9.62E-03	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.03E-02	2.31E-02	0.00E+00	8.88E-02	0.00E+00
EP-freshwater[1]	[kg P eq.]	0.00E+00	0.00E+00	6.80E-07	6.80E-07	2.42E-05	0.00E+00	MND	MND	MND	MND	MND	MND	MND	3.29E-06	5.81E-05	0.00E+00	1.63E-04	0.00E+00
EP-marine	[kg N eq.]	0.00E+00	0.00E+00	9.44E-04	9.44E-04	1.91E-03	0.00E+00	MND	MND	MND	MND	MND	MND	MND	4.57E-03	4.59E-03	0.00E+00	3.03E-02	0.00E+00
EP-terrestrial	[mol N eq.]	0.00E+00	0.00E+00	1.03E-02	1.03E-02	2.13E-02	0.00E+00	MND	MND	MND	MND	MND	MND	MND	5.01E-02	5.12E-02	0.00E+00	3.33E-01	0.00E+00
POCP	[kg NMVOC eq.]	0.00E+00	0.00E+00	2.85E-03	2.85E-03	8.19E-03	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.38E-02	1.97E-02	0.00E+00	9.64E-02	0.00E+00
ADP-minerals&metals[2]	[kg Sb eq.]	0.00E+00	0.00E+00	2.82E+00	2.82E+00	5.14E+01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.36E+01	1.23E+02	0.00E+00	2.47E+02	0.00E+00
ADP-fossils[2]	[MJ] ncv	0.00E+00	0.00E+00	1.06E-07	1.06E-07	1.20E-05	0.00E+00	MND	MND	MND	MND	MND	MND	MND	5.11E-07	2.89E-05	0.00E+00	3.44E-05	0.00E+00
WDP[2]	m^3 world eq. deprived	0.00E+00	0.00E+00	4.40E-03	4.40E-03	1.56E-01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	2.13E-02	3.76E-01	0.00E+00	1.08E+01	0.00E+00

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels (GWP-fossil; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossils = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

[2]The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

ND = Module not declared; INA = Indicator not assessed.

4.1.B. LCA results - IMS Aggregates/Sands (Scenario B, 100% recycling)

Resource use per one tonne of aggregate/sand

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	0.00E+00	0.00E+00	1.58E-02	1.58E-02	7.34E-01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	7.66E-02	1.76E+00	0.00E+00	4.23E+00	0.00E+00
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	0.00E+00	0.00E+00	1.58E-02	1.58E-02	7.34E-01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	7.66E-02	1.76E+00	0.00E+00	4.23E+00	0.00E+00
PENRE	[MJ]	0.00E+00	0.00E+00	2.99E+00	2.99E+00	5.45E+01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.45E+01	1.31E+02	0.00E+00	2.63E+02	0.00E+00
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	0.00E+00	0.00E+00	2.99E+00	2.99E+00	5.45E+01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.45E+01	1.31E+02	0.00E+00	2.63E+02	0.00E+00
SM	[kg]	1.00E+03	0.00E+00	0.00E+00	1.00E+03	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	0.00E+00	0.00E+00	1.61E-04	1.61E-04	5.81E-03	0.00E+00	MND	MND	MND	MND	MND	MND	MND	7.77E-04	1.40E-02	0.00E+00	2.62E-01	0.00E+00

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water.

ND = Module not declared; INA = Indicator not assessed.

4.1.C. LCA results - IMS Aggregates/Sands (Scenario B, 100% recycling)

Output flows and waste categories per one tonne of aggregate/sand

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	0.00E+00	0.00E+00	7.71E-06	7.71E-06	1.34E-04	0.00E+00	MND	MND	MND	MND	MND	MND	MND	3.73E-05	3.22E-04	0.00E+00	3.83E-04	0.00E+00
NHWD	[kg]	0.00E+00	0.00E+00	3.76E-03	3.76E-03	2.69E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.82E-02	6.46E+00	0.00E+00	1.00E+03	0.00E+00
RWD	[kg]	0.00E+00	0.00E+00	1.94E-05	1.94E-05	3.47E-04	0.00E+00	MND	MND	MND	MND	MND	MND	MND	9.40E-05	8.34E-04	0.00E+00	1.48E-03	0.00E+00
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

ND = Module not declared; INA = Indicator not assessed.

4.1.D. LCA results - IMS Aggregates/Sands (Scenario B, 100% recycling)

Additonal Environmental impact per one tonne of aggregate/sand

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Disease incidence	0.00E+00	0.00E+00	5.71E-08	5.71E-08	2.72E-07	0.00E+00	MND	MND	MND	MND	MND	MND	MND	2.76E-07	6.54E-07	0.00E+00	1.77E-06	0.00E+00
IRP[1]	kBq U235 eq	0.00E+00	0.00E+00	1.20E-02	1.20E-02	2.23E-01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	5.80E-02	5.36E-01	0.00E+00	9.67E-01	0.00E+00
ETP-fw[2]	CTUe	0.00E+00	0.00E+00	1.65E+00	1.65E+00	4.03E+01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	7.97E+00	9.69E+01	0.00E+00	1.76E+02	0.00E+00
HTP-c[2]	CTUe	0.00E+00	0.00E+00	6.37E-11	6.37E-11	1.30E-09	0.00E+00	MND	MND	MND	MND	MND	MND	MND	3.08E-10	3.12E-09	0.00E+00	7.58E-09	0.00E+00
HTP-nc[2]	CTUe	0.00E+00	0.00E+00	1.19E-09	1.19E-09	4.07E-08	0.00E+00	MND	MND	MND	MND	MND	MND	MND	5.78E-09	9.79E-08	0.00E+00	1.18E-07	0.00E+00
SQP[2]	dimensionless	0.00E+00	0.00E+00	3.58E-01	3.58E-01	3.58E+01	0.00E+00	MND	MND	MND	MND	MND	MND	MND	1.73E+00	8.60E+01	0.00E+00	5.92E+02	0.00E+00

PM = Potential incidence of disease due to PM emissions, IRP = Potential Human exposure efficiency relative to U235, ETP-fw = Potential Comparative Toxic Unit for ecosystems; HTP-c:Potential Comparative Toxic Unit for humans, HTP-nc = Potential Comparative Toxic Unit for humans, SQP = Potential soil quality index.

[1] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuelcycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

[2] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

ND = Module not declared; INA = Indicator not assessed.

5. Calculation rules

Cut-off criteria

All relevant inputs and outputs - like emissions, energy and materials - have been taken into account in this LCA, and in accordance with EN15804+A2:2019. The study covers at least 95% of the materials and energy per module and at least 99% of the total use of materials and energy of each unit process. Long term emissions have been excluded from the study.

Data Quality

The data Quality Level, according to Table E.1 of EN 15804 +A2, Annex E, is "good", as clarified below:

- Time Representativeness is considered to be Good: the difference between the reference year (2024) and the reference year (2021) for the Ecoinvent v 3.8 dataset which the data are representative is 3 years.
- Geographical Representativeness is considered to be Very Good: data is from area under study.
- Technical Representativeness is considered to be Very Good: data is from the processes and products under study. The same state of technology that is used by Integrated Materials Solutions is that defined in goal and scope.

Allocations

The measurement of environmental impacts in this EPD uses the LCIA methodologies recommended for PEF3.0. In this EPD, the waste processes are allocated in the relevant module. In the case of the use of secondary materials or energy recovered from secondary fuels, the system boundary between the system under study and the previous system (providing the secondary materials) is set where outputs of the previous system, e.g. materials, products, building elements or energy, reach the end-of-waste state. The modularity and the polluter payer principles have been followed.

Allocation of energy types and amounts to the various manufacturing processes has been provided by the manufacturer, along with any production waste and direct emissions; allocation of impacts to the products is based on the product composition mass.

Assumptions

N/A.

6. Scenarios and additional technical information

A4. Transport to customer

The transport distance to the market is taken to be 30km. The trucks taking recycled product to construction sites normally return to the IMS site with material removed from site for processing at the IMS plant site, thus capacity utilisation is 90%. Bulk density of transported goods is 1,500 kg/m3.

A5. Installation

Installation losses are zero. No ancillary materials or energy is used in installation.

C1 - C4, D End of life and benefits/loads beyond the system boundary

Two C1-C4, D Stages are reported on in this EPD: Scenario A and Scenario B.

Scenario A: All material is recycled at end of life (100% recycled).

C1 Deconstruction: Excavation of material for reprocessing.
C2 Transport: Transport 50km to recycling.
C3 Waste processing: All aggregates recycled.
C4 Disposal: No material is disposed.
D: Benefits/loads beyond the system boundary: No benefit/load beyond the system boundary, as all material has been previously recycled.

Scenario B: All material is landfilled at end of life (100% landfilled).

C1 Deconstruction: Excavation of material for disposal.
C2 Transport: Transport 50km to landfill.
C3 Waste processing: No aggregates recycled.
C4 Disposal: All material is disposed in landfill
D: Benefits/loads beyond the system boundary: No benefit/load beyond the system boundary, as no material leaves the system.

Declaration of biogenic carbon content at the production gate

Biogenic carbon (kg per declared unit)	Quantity	Unit
Biogenic carbon content in product	0	kg C
Biogenic carbon content in packaging	0	kg C

7. Mandatory additional information on release of dangerous substances to indoor air, soil and water

None of the substances contained in the product are listed in the “Candidate List of Substances of Very High Concern for authorisation”, or they do not exceed the limit for registration with the European Chemicals Agency.

8. Other optional additional environmental information

N/A.

9. References

[1] I.S. EN 15804:2012+A2:2019,: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products', EN 15804:2012+A2:2019.

[2] Product Category Rules: Part A, Implementation and use of EN 15804:2012+A1:2013, EN 15804:2012+A2:2019 and CEN TR 16970:2016 in Ireland for the development of Environmental Product Declarations", version 2.1, issued on 05/03/2022.

[3] EN 13242:2013 Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction.

[4] EN 12620:2013 Aggregates for concrete

[5] https://www.epa.ie/publications/licensing--permitting/waste/Final-Decision---National-End-of- Waste-Criteria-N001-2023.pdf

10. Annex

N/A.