Green Vision
Reclaim. Recycle. Repurpose.

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804+A2:2019 for:
Recycled Crushed Concrete Aggregates from Green Vision Recycling

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AUSTRALASIA EPD®
ENVIRONMENTAL PRODUCT DECLARATION

ECO PLATFORM
EPD
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GREEN VISION RECYCLING

Green Vision Recycling (Green Vision, GVR) is a producer of recycled aggregate and fill materials for use in construction, infrastructure, and landscaping projects.

Green Vision recovers construction and infrastructure materials from various activities in Auckland which are then selectively recycled into premium materials to be re-purposed.

Green Vision's operations are conveniently based in Onehunga, Auckland. This makes Green Vision a locally accessible source of aggregate to supply Auckland construction activities and to be able to recycle associated construction waste, helping to reduce transport costs and the impacts on the environment.

Green Vision is a Downer company.

OUR COMMITMENT TO SUSTAINABILITY

Green Vision is committed to providing environmentally sustainable engineering solutions that enable the recovery and reuse of materials and assets.

This commitment is a contribution towards Downer's decarbonisation strategy, which in turn is part of Downer's Environmental, Sustainability and Governance (ESG) goals, aligning with the UN Sustainable Development Goals, specifically:

Goal 9 Industry, Innovation and Infrastructure
Goal 11 Sustainable Cities and Communities
Goal 12 Responsible Consumption and Production
Goal 13 Climate Action

Green Vision was established out of a desire within the industry to take greater responsibility for the impact that waste materials from construction and maintenance activities have on the environment. Green Vision was founded to reduce the pressure construction places on the country's natural resources and in turn, reduce construction waste to landfills.

The construction industry is becoming more aware of the impact of construction and construction materials and their responsibility to manage and reduce these impacts. This is driven by the adoption of sustainability rating tools, client and government requirements, and public perception.

It has therefore become even more important for the construction industry to take action to reduce these impacts, such as embodied carbon, resource depletion and waste sent to landfill, by adopting a more sustainable approach to the recovery of construction assets reaching the end of their useful life.

The biggest challenge has been to turn ideas, policies, and plans into engineering reality. Green Vision is at the forefront of this change to focus on the recovery and recycling of construction wastes to produce consistently high-quality construction materials.

Green Vision accepts a diverse range of recovered materials, arisings, and waste streams to be recycled into a range of useful materials and is well placed to assist the construction industry to reduce reliance on virgin materials.

GREEN VISION RECYCLED CONCRETE PRODUCTS

Our production of high-quality recycled aggregates starts with the careful selection of appropriate recovered resources. Only clean concrete that is suitable for recycling is selected from the diverse range of waste streams accepted into the site, specifically avoiding brick, glass, asphalt and other common construction waste materials.

The clean concrete is processed through specialised recycling equipment, including a rotary impact crusher which can be carefully adjusted for desired size and shape characteristics.

This ensures consistent production of clean, high-quality recycled concrete products with low debris contents.

Whilst concrete waste can be crushed to meet specific customer and market demands, we typically produce and stock:

GAP100	Suitable for large fill
GAP65	Graded specification
GAP40	Graded specification

Our recycled concrete aggregates are designed to perform at least comparably with virgin aggregate equivalents and to meet specific project requirements. This makes them a viable alternative to conventional quarried aggregates, with the potential for significant sustainability advantages.

Our recycled concrete products are produced to comply with at least M4 and AT800 specifications.

WHAT IS AN EPD?

An Environmental Product Declaration (EPD) is an independent, verified and transparent declaration of the environmental impact of a product; in this case Recycled Crushed Concrete (RCC) aggregate.

Our EPD quantifies the environmental impact of products through life cycle assessment (LCA), a science based approach. The Green Vision EPD covers the life cycle stages for Production and End-of-life.

The data in this EPD can feed into the Infrastructure Sustainability Council (ISC) IS rating tool and the New Zealand Green Building Council Green Star tool.

PRODUCTS COVERED BY EPD

This EPD covers Recycled Crushed Concrete (RCC) aggregates produced at Green Vision Recycling's site in Onehunga, New Zealand, specifically GAP100, GAP65, and GAP40.

The product category corresponds to UN CPC 89420 Non-metal waste and scrap recovery (recycling) services, on a fee or contract basis. The ANZSIC Business industry code is 29220 Recycling of other non-metal waste and scrap.

QUALITY OF MATERIALS

Green Vision produces premium products by selecting only clean concrete waste as production feedstock.

Waste streams brought into our site are visually inspected for contamination prior to unloading into segregated stockpiles. The stockpiles are carefully maintained to avoid cross-contamination, and the clean concrete waste stockpile is inspected for contamination prior to crushing.

During production, we undertake routine quality testing of the stockpiled materials and the finished product to ensure that it meets specification, based on NZS 4407:2015 and NZD4402:1986. The debris rates stated on our Recycled Concrete Aggregate technical data sheets show that very low rates of debris are detected and are well below M4 and AT800 debris specification limits.

TABLE 1: Content declaration

Product components	Mass (kg)	Post-consumer material, % mass	Renewable material, % mass	Environmental / hazardous properties
Crushed Concrete	1,000	100%	0%	None
TOTAL	1,000	100%	0%	None
Packaging materials	Mass (kg)	Mass % (versus the product)		
N/A – The product is transported in bulk and is not packaged	N/A	N/A	N/A	N/A

Green Vision Recycling's RCC aggregate products consist of 100% recycled crushed concrete from post-consumer waste. No additional materials are added during production. Concrete is typically produced from cementitious materials, aggregates, additives and water. Compositions vary depending on the purpose, but the composition is not relevant for RCC.

RCC aggregates are sold in bulk, and packaging materials are not relevant for the product.

Recycled Crushed Concrete is inert and does not contain any materials on the Candidate List of substances of very high concern (SVHC) by the European Reach Regulation at a concentration greater than 0.1% by mass.

DECLARED UNIT

The declared unit for the EPD is 1 tonne of recycled crushed concrete aggregate.

SYSTEM BOUNDARIES

This EPD has a 'Cradle to gate' scope with modules C1–C4 and module D (A1–A3 + C + D) included as shown in the table below. It includes the environmental impacts associated with stockpiling and loading the recycled crushed concrete aggregate (A1-A3), end-of-life modules (C1-C4) and recovery stage (D).

The RCC product is expected to be used as a granular material and to retain its nature at end-of-life, so does not meet the criteria for exclusion of the end-of-life stages. RCC aggregates are not typically used as raw materials for concrete production.

Other life cycle stages (Modules A4-A5, B1-B7) are dependent on particular scenarios and best modeled at the project level.

TABLE 2: Modules included in the scope of the EPD

	Product stage			Construction process stage		Use stage							End-of-life stage				Resource recovery stage
	Raw material supply	Transport of raw materials	Manufacturing	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport to waste processing	Waste processing	Disposal	Future reuse, recycling or energy recovery potential
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	NZ	NZ	NZ										NZ	NZ	NZ	NZ	NZ
Specific Data	>90%																
Variation: Products	N/A																
Variation: Sites	N/A																

X = Included in the EPD. ND = Module not declared (such a declaration shall not be regarded as an indicator result of zero)

PRODUCTION (MODULE A)

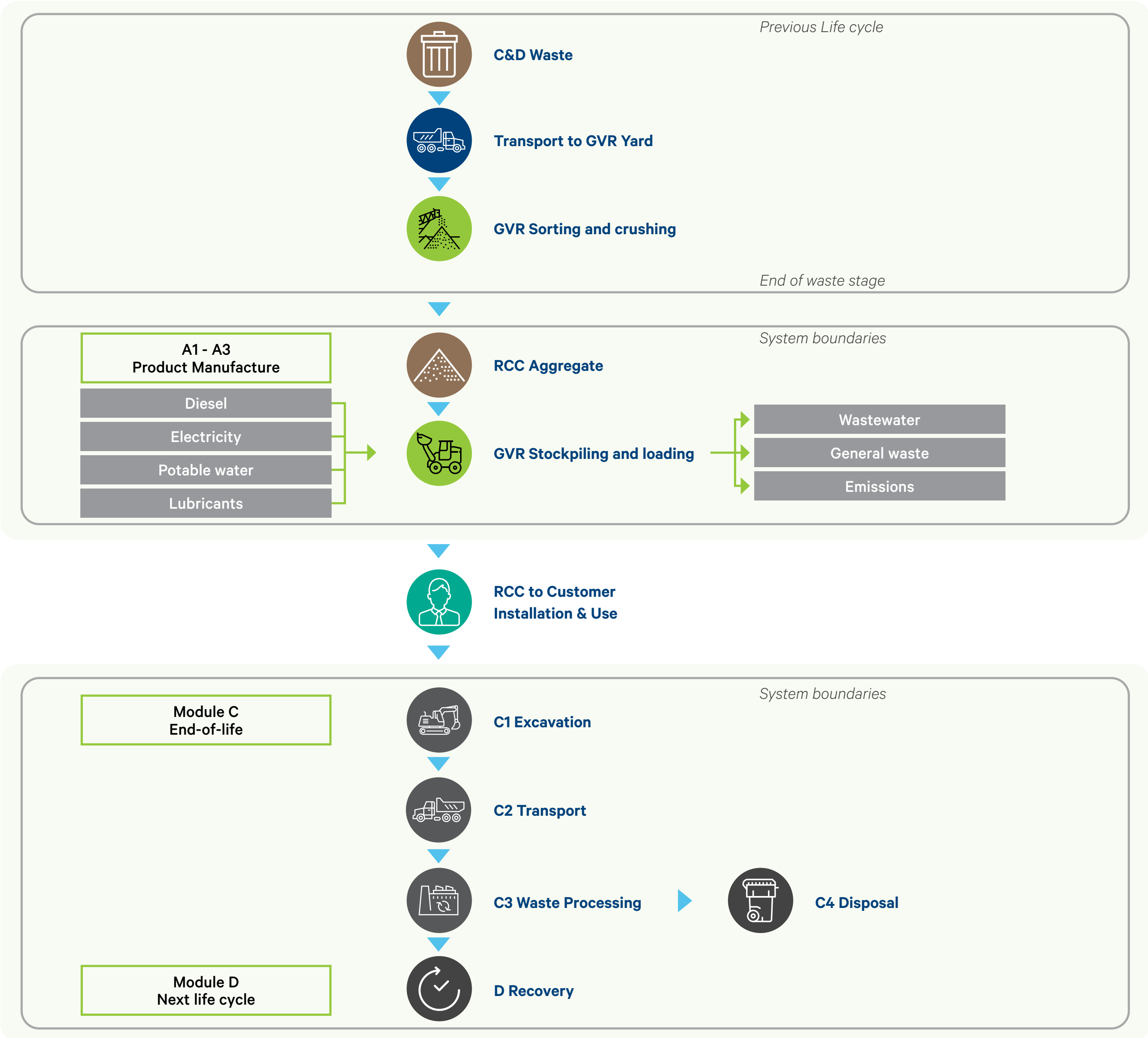
The product stage looks at the environmental impacts associated with manufacturing the recycled crushed concrete aggregates until they leave Green Vision's yard.

Concrete waste is sourced from a variety of projects in the Auckland region, with materials considered to have reached the end-of-waste state after they have been crushed at Green Vision Recycling's yard. Processes that are part of the waste processing in the previous product system are excluded, in line with the polluter pays principle (PPP), including the collection, transport, sorting and crushing of the waste concrete.

The production of ancillary materials (tap water, lubricants), as well as the generation of fuels and electricity from primary energy resources have been included in module A1.

The on-site movement of the crushed aggregates, via a front-end loader, is the core process included in this LCA. Overall maintenance of the site, including water used for dust suppression and cleaning, electricity consumption in the site office, and disposal of general waste is also included.

Product life cycle of recycled concrete aggregates



END OF LIFE (MODULE C)

The end-of-life stage considers the environmental impacts associated with the RCC aggregate after it has reached the end of its useful life in a building or other infrastructure asset.

This EPD considered two end-of-life scenarios of Recycling and Disposal. Both scenarios are currently in use and are representative of the most probable alternatives. In Auckland the recycling scenario is increasingly preferred due to the costs to transport waste and virgin aggregates long distances. Recycling is also the scenario that matches the end-of-life of the previous life cycle for the RCC aggregate.

In the Disposal scenario, the waste stream would still typically be tipped at GVR's site, enabling demolition firms to minimise transport distance and turnaround time for trucks. The waste stream is handled as spoil and then loaded for further transport to cleanfill at Drury Quarry. The handling impacts at GVR have been included in C2 along with both transport steps, since there is no processing and GVR is simply used as a depot.

RCC is predominantly used for sub-base, and this could well be left in place and reused. However, in this case it would not be considered to have reached end-of-life, so this has not been modeled as a scenario. The waste flows for each scenario at end-of-life are shown in **Table 3**, and a brief explanation of the two scenarios is given in **Table 4**.

TABLE 3: Waste flows at end of life

Module	Processes	Unit	Recycling	Disposal
C1	Collected separately	t	1	0
	Collected with mixed construction waste	t	0	1
C3	Recovery for recycling	t	1	0
C4	Disposal to landfill	t	0	1
D	Net Scrap	t	0	-1

TABLE 4: End-of-life scenarios considered in this EPD

Module	Recycling	Disposal
C1	Extracted and collected from the construction site using a generic 100 kW excavator (assumed to be at Auckland CBD)	Extracted and collected from the construction site using a generic 100 kW excavator (assumed to be at Auckland CBD)
C2	Transferred to GVR site. Estimated (conservative) distance from Auckland CBD to site: 20km	Transferred to GVR site (20 km) and handled as spoil (e.g. contaminated) using GVR excavator and dirty loader, then loaded and transported to clean fill at Drury Quarry (40 km).
C3	Sifted using GVR excavator to produce RCC: reaches end of waste state.	N/A
C4	N/A	Disposal as inert waste to landfill.*

** Note that the landfill dataset is likely conservative for the clean inert waste flow resulting from RCC, since the dataset models sealing and leachate treatment.*

RECOVERY (MODULE D)

Module D starts at the "end of waste" state, when the RCC is no longer a product in the current life cycle and starts to be a potential input for the next life cycle. In the recycling scenario, the RCC reaches the end of waste state after it has been collected, sifted and stockpiled and is available for purchase.

Module D gives a credit or debit for the net recycling of a product, as prescribed in EN 15804. Of the waste material available for recycling at end-of-life, the input of recycled material needed for GVR's RCC production is satisfied first, with the remainder (net) available for recycling through Module D. GVR's RCC product replaces virgin aggregate, so the Module D credit is modelled using crushed virgin aggregate.

For the recycling scenario, GVR's process shows that 100% of the clean waste stream is recycled. However, the input to GVR's RCC aggregate production is 100% recycled content. The net recycling rate for RCC is therefore 0, so no credits are calculated.

For the landfill scenario, no material is available for recycling and the net recycling rate is therefore -1. This means that 100% of the scrap input demand for A1-A3 must be satisfied from Module D (with virgin aggregate), creating a burden.

LIFE CYCLE ASSESSMENT METHODOLOGY

LIFE CYCLE INVENTORY DATA

Primary data were collected for Green Vision Recycling's operations for the financial year 2021, from 1 July 2020 to 30 June 2021. Secondary data were sourced from the GaBi Life Cycle Inventory Database 2021.2 (Sphera, 2021) for energy and material input materials. Most of these datasets have a reference year between 2017 and 2020, and all fall within the 10-year limit allowable for generic data under EN15804.

At end-of-life, the deconstruction is assumed to be done by a 100kW construction excavator. The recycling process at Green Vision is modelled using a 100kW construction excavator, with fuel inputs modified to reflect the actual fuel consumption by GVR's excavator and crusher. Disposal has been modelled as inert matter going to landfill.

AVERAGE PRODUCT AND ALLOCATION

The RCC products included in this EPD are GAP100, GAP65, and GAP40, which are all grouped as one product as they all go through the same processes for manufacturing.

GVR produces a number of aggregate products, including RCC aggregates, Recycled Asphalt Pavement (RAP), and virgin aggregates. The same loader is used for stockpile maintenance and loading out of all aggregates products sold at the site, and similarly the site overheads are equally applicable to all products sold at the site. Allocation is needed since the inputs and outputs are only measured at the site (or equipment) level. Impacts associated with these inputs and outputs have been allocated on a mass basis, with the assumption that all products require the same share.

Allocation of background data (i.e. energy and materials) taken from the GaBi LCI Database 2021.2 (Sphera, 2021) is documented online.

CUT OFF CRITERIA

As per the PCR 2019:14 v1.11 section 4.3.1 (EPD International, 2021), inventory flows from personnel-related activities, infrastructure, construction, produciton equipment, and tools that are not directly consumed in the production process can be excluded from the LCI, if not known to have the potential to cause significant impact.

The production equipment used at GVR is not known to have the potential to cause significant impact, since much of it is purchased second hand and all equipment is expected to have a lifetime of 10 years or more, and has therefore been excluded.

Packaging for inbound raw materials (lubricants) is minimal and has been excluded from the LCI. All other reported data were incorporated and modelled using the best available life cycle inventory data.

ASSESSMENT INDICATORS

The results cover the environmental impact indicators, describing the potential environmental impacts of the product, including optional additional indicators, and indicators used in the previous standard; and life cycle inventory indicators, describing resource use and waste and other outputs, as seen on **Table 5** (page 10).

ENVIRONMENTAL IMPACT INDICATORS

CLIMATE CHANGE (GLOBAL WARMING POTENTIAL)

(GWP-total, GWPf, GWPb, GWPluc)

Primary data were collected for Green Vision Recycling's operations for the financial year 2021, from 1 July 2020 to 30 June 2021. Secondary data were sourced from the GaBi Life Cycle Inventory Database 2021.2 (Sphera, 2021) for energy and material input materials. Most of these datasets have a reference year between 2017 and 2020, and all fall within the 10-year limit allowable for generic data under EN15804.

PHOTOCHEMICAL OZONE FORMATION POTENTIAL

(POCP)

Photochemical Ozone Formation Potential gives an indication of the emissions from precursors that contribute to ground level smog formation, mainly ozone (O_3). Ground level ozone may be harmful to human health and ecosystems and may also damage crops. These emissions are produced by the reaction of volatile organic compounds (VOCs) and carbon monoxide in the presence of nitrogen oxides and UV light.

ABIOTIC RESOURCE DEPLETION

(ADP-mm, ADPf)

The consumption of non-renewable resources decreases the availability of these resources and their associated functions in the future. Depletion of mineral resources and non-renewable energy resources are reported separately. Depletion of mineral resources is assessed based on total reserves.

ACIDIFICATION POTENTIAL

(AP)

Acidification Potential is a measure of emissions that cause acidifying effects to the environment. A molecule's acidification potential indicates its capacity to increase the hydrogen ion (H^+) concentration in the presence of water, thus decreasing the pH value. Potential effects include fish mortality, forest decline, and the deterioration of building materials.

EUTROPHICATION POTENTIAL

(EP-fw, EP-fm, EP-tr)

Eutrophication covers all potential impacts of excessively high levels of macronutrients, the most important of which are nitrogen (N) and phosphorus (P). In aquatic ecosystems where this term is mostly applied, this typically describes a degradation in water quality. Eutrophication can result in an undesirable change in the type of species that flourish and an increase the production of biomass. As the decomposition of biomass consumes oxygen, eutrophication may decrease the available oxygen level in the water column and threaten fish in their ability to respire.

OZONE DEPLETION POTENTIAL

(ODP)

Depletion of the ozone leads to higher levels of UVB ultraviolet rays reaching the earth's surface with detrimental effects on humans and plants. The Ozone Depletion Potential is a measure of air emissions that contribute to the depletion of the stratospheric ozone layer.

WATER

(WDP)

Water scarcity is a measure of the stress on a region due to water consumption.

TABLE 5: Indicators for life cycle impact assessment

Abbreviation	Impact category / Indicator
Environmental Impact Indicators in accordance with EN15804+A2	
GWP-total	Climate change – total
GWP-fossil	Climate change – fossil
GWP-biogenic	Climate change – biogenic
GWP-luluc	Climate change – land use and land use change
ODP	Ozone depletion
AP	Acidification
EP-freshwater	Eutrophication aquatic freshwater
EP-marine	Eutrophication aquatic marine
EP-terrestrial	Eutrophication terrestrial
POCP	Photochemical ozone formation
ADP-minerals&metals	Depletion of abiotic resources – minerals and metals
ADP-fossil	Depletion of abiotic resources – fossil fuels
WDP	Water Depletion Potential
Life cycle inventory parameters on use of resources	
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	Total use of net fresh water
Life cycle inventory parameters on waste categories and output flows	
HWD	Hazardous waste disposed
NHWD	Non-hazardous waste disposed
RWD	Radioactive waste disposed
CRU	Components for reuse
MER	Materials for energy recovery
MFR	Materials for recycling
EEE	Exported electrical energy
EET	Exported thermal energy
Additional Environmental Impact Indicators in accordance with EN15804+A2	
GWP-GHG	Global warming potential (IPCC AR5)
PM	Particulate Matter emissions
IRP	Ionising Radiation – human health
ETP-fw	Eco-toxicity (freshwater)
HTP-c	Human Toxicity, cancer
HTP-nc	Human Toxicity, non-cancer
SQP	Land use related impacts / soil quality
Environmental Impact Indicators in accordance with EN15804+A1	
GWP	Global warming potential
ODP	Ozone depletion potential
AP	Acidification potential
EP	Eutrophication potential
POCP	Photochemical ozone creation potential
ADPE	Abiotic depletion potential for non-fossil resources
ADPF	Abiotic depletion potential for fossil resources

ENVIRONMENTAL PERFORMANCE
FOR 1 TONNE OF RECYCLED CRUSHED CONCRETE AGGREGATE

Environmental impact potentials: Mandatory under EN15804+A2:2019

		Production	Recycling					Disposal				
Parameter	**Unit**	**A1 - A3**	**C1**	**C2**	**C3**	**C4**	**D**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	0.827	0.644	1.91	2.15	0	0	0.644	8.20	0	15.2	6.62
GWP-fossil	kg CO_2 eq.	0.793	0.644	1.91	2.15	0	0	0.644	8.20	0	15.1	6.57
GWP-biogenic	kg CO_2 eq.	0.0343	0	0	1.64E-06	0	0	0	2.28E-06	0	0	0.0263
GWP-luluc	kg CO_2 eq.	8.45E-05	1.30E-05	3.84E-05	4.39E-05	0	0	1.30E-05	1.66E-04	0	0.0444	0.0270
ODP	kg CFC 11 eq.	3.73E-16	9.48E-17	2.80E-16	3.21E-16	0	0	9.48E-17	1.21E-15	0	5.88E-14	8.94E-14
AP	mol H^+ eq.	0.00141	0.00323	0.00345	0.00448	0	0	0.00323	0.0156	0	0.108	0.0173
EP-freshwater	kg P eq.	2.62E-05	1.06E-07	3.13E-07	3.69E-07	0	0	1.06E-07	1.37E-06	0	2.54E-05	1.80E-05
EP-marine	kg N eq.	6.80E-04	0.00153	0.00144	0.00194	0	0	0.00153	0.00645	0	0.0280	0.00582
EP-terrestrial	mol N eq.	0.00633	0.0168	0.0159	0.0212	0	0	0.0168	0.0709	0	0.307	0.0672
POCP	kg NMVOC eq.	0.00187	0.00429	0.00336	0.00558	0	0	0.00429	0.0166	0	0.0847	0.0148
ADP-minerals&metals*	kg Sb eq.	1.92E-08	9.95E-09	2.94E-08	3.38E-08	0	0	9.95E-09	1.27E-07	0	1.43E-06	1.30E-06
ADP-fossil*	MJ	10.6	8.54	25.3	28.9	0	0	8.54	109	0	201	105
WDP*	m^3 world eq	1.31	0.00421	0.0125	0.0143	0	0	0.00421	0.0540	0	1.62	2.79

**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 experience with the indicator.*

Use of resources

		Production	Recycling					Disposal				
Parameter	**Unit**	**A1 - A3**	**C1**	**C2**	**C3**	**C4**	**D**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1.41	0.0417	0.123	0.141	0	0	0.0417	0.533	0	27.0	32.5
PERM	MJ	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	1.41	0.0417	0.123	0.141	0	0	0.0417	0.533	0	27.0	32.5
PENRE	MJ	10.6	8.54	25.3	28.9	0	0	8.54	109	0	201	105
PENRM	MJ	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	10.6	8.54	25.3	28.9	0	0	8.54	109	0	201	105
SM	kg	1,000	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	0.0327	8.28E-05	2.45E-04	2.81E-04	0	0	8.28E-05	0.00106	0	0.0495	0.0825

Waste production and output flows

		Production	Recycling					Disposal				
Parameter	**Unit**	**A1 - A3**	**C1**	**C2**	**C3**	**C4**	**D**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	1.80E-10	3.08E-11	9.12E-11	1.05E-10	0	0	3.08E-11	3.95E-10	0	2.13E-08	1.98E-08
NHWD	kg	0.0569	2.04E-04	6.04E-04	6.92E-04	0	0	2.04E-04	0.00261	0	1,000	0.0551
RWD	kg	8.50E-06	1.18E-06	3.48E-06	3.97E-06	0	0	1.18E-06	1.50E-05	0	0.00211	0.00989
CRU	kg	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	1,000	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0	0	0	0	0
EET	MJ	0	0	0	0	0	0	0	0	0	0	0

OTHER ENVIRONMENTAL INDICATORS

Potential Environmental Impacts – Additional Indicators

		Production	Recycling					Disposal				
Indicator	**Unit**	**A1 - A3**	**C1**	**C2**	**C3**	**C4**	**D**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG	kg CO_2 eq.	0.813	0.642	1.90	2.15	0	0	0.642	8.18	0	15.0	6.58
PM	Disease incidence	8.69E-09	3.72E-08	2.44E-08	4.93E-08	0	0	3.72E-08	1.27E-07	0	1.34E-06	6.11E-07
IRP ^	kBq U-235-eq.	0.00110	1.38E-04	4.09E-04	4.66E-04	0	0	1.38E-04	0.00176	0	0.222	1.62
ETP-fw*	CTUe	8.38	3.26	9.65	11.0	0	0	3.26	41.7	0	114	54.4
HTP-c*	CTUh	1.20E-10	5.57E-11	1.65E-10	1.88E-10	0	0	5.57E-11	7.12E-10	0	1.69E-08	1.56E-09
HTP-nc*	CTUh	5.17E-09	2.86E-09	5.98E-09	7.06E-09	0	0	2.86E-09	2.73E-08	0	1.86E-06	9.26E-08
SQP*	-	318	0.0219	0.0648	0.0742	0	0	0.0219	0.280	0	40.5	33.0

^This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. 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

** 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 experience with the indicator.*

Potential Environmental Impacts – In accordance with EN 15804+A1

		Production	Recycling					Disposal				
Parameter	**Unit**	**A1 - A3**	**C1**	**C2**	**C3**	**C4**	**D**	**C1**	**C2**	**C3**	**C4**	**D**
GWP	kg CO_2-eq.	0.805	0.634	1.88	2.12	0	0	0.634	8.09	0	14.8	6.45
ODP	kg CFC11-eq.	4.98E-16	1.26E-16	3.74E-16	4.28E-16	0	0	1.26E-16	1.62E-15	0	7.84E-14	1.19E-13
AP	kg SO_2-eq.	0.00103	0.00226	0.00249	0.00322	0	0	0.00226	0.0113	0	0.0857	0.0127
EP	kg PO_4^{3-}-eq.	4.04E-04	5.14E-04	4.91E-04	6.54E-04	0	0	5.14E-04	0.00219	0	0.00972	0.00239
POCP	kg ethene-eq.	1.71E-04	2.12E-04	-4.07E-04	3.34E-04	0	0	2.12E-04	-6.57E-04	0	0.00657	1.20E-04
ADPE	kg Sb-eq.	1.93E-08	9.96E-09	2.95E-08	3.38E-08	0	0	9.96E-09	1.27E-07	0	1.44E-06	1.37E-06
ADPF	MJ	10.6	8.53	25.2	28.9	0	0	8.53	109	0	195	79.5

Biogenic carbon content

Biogenic Carbon Content	**Unit**	**Quantity**
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

REFERENCES

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GENERAL INFORMATION

An Environmental Product Declaration, or EPD, is a standardised and verified way of quantifying the environmental impacts of a product based on a consistent set of rules known as a PCR (Product Category Rules).

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. The results for EN15804+A1 compliant EPDs are not comparable with EN15804+A2 compliant studies as the methodologies are different. EN 15804+A1 compliant results are included in this document to assist comparability across EPDs.

Declaration owner: Green Vision Recycling

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Geographical Scope New Zealand

Reference Year for Data 1 July 2020 – 30 June 2021

EPD produced by:

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EPD programme operator:

AUSTRALASIA EPD® ENVIRONMENTAL PRODUCT DECLARATION

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CEN standard EN 15804+A2 served as the core PCR

PCR: PCR 2019.14 Construction Products Version 1.11, 2021-02-05

PCR review was conducted by: The Technical Committee of the International EPD® System

Chair: Martin Erlandsson. Contact via info@environdec.com

Independent verification of the declaration and data, according to ISO 14025:

☐ EPD process certification (Internal)
☒ EPD verification (External)

Third party verifier: Rob Rouwette (start2see Pty Ltd)
Email: rob.rouwette@start2see.com.au

Verifier approved by: EPD Australasia

Procedure for follow-up of data during EPD validity involved third-party verifier

☐ Yes
☒ No

Green Vision

Reclaim. Recycle. Repurpose.