ResourceCo

ENVIRONMENTAL PRODUCT DECLARATION

-7 MM RECYCLED SAND

ISO 14025.2006 and EN 15804+A2:2019/AC:2021

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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at https://epd-australasia.com/

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AUSTRALASIA EPD® ENVIRONMENTAL PRODUCT DECLARATION

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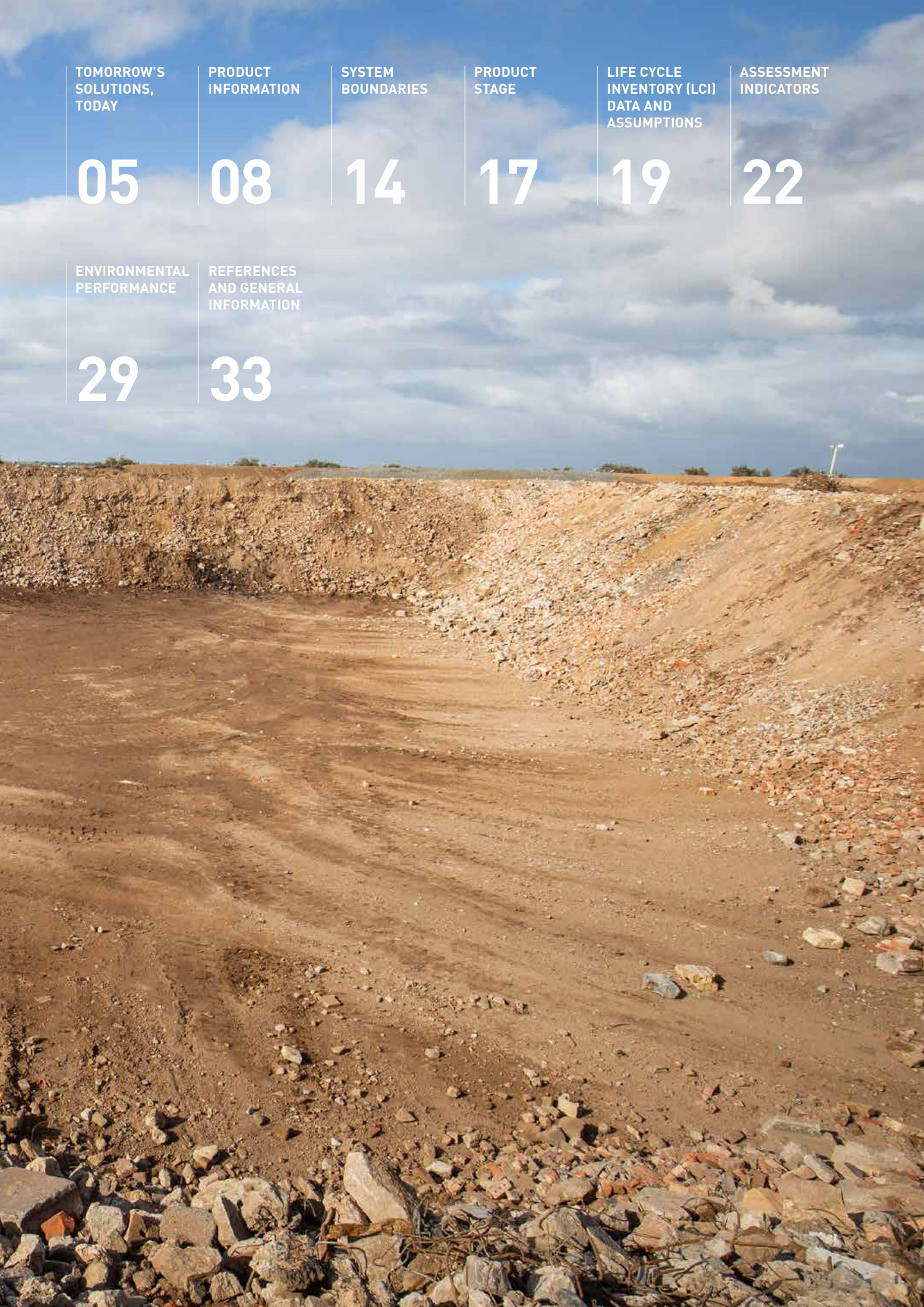

Tomorrow's solutions, today

ABOUT RESOURCECO

ResourceCo is a global leader in the recovery and re-manufacturing of primary resources, extracting maximum value from materials otherwise destined for landfill. We work with governments, communities and multinational companies to progress the circular economy and preserve natural resources for a sustainable future.

By adopting innovative advanced re-manufacturing principles, and a maintaining a continued focus on process and product quality, ResourceCo is one of Australia's most diversified recyclers capable of recovering resources from construction and demolition (C&D), commercial and industrial waste, soils and tyres.

ResourceCo's beginnings were humble, yet our ambition was bold; to be leaders in resource recovery living true to our brand promise to leave the world in a better place than we found it.

CONSTRUCTION & DEMOLITION MATERIAL RECYCLING

We provide a wide range of recycled products, including pavement and asphalt type materials, aggregates, concrete and sand, and services to major civil engineering projects and both residential and commercial construction.

The cornerstone of the business is the processing of C&D waste materials, consisting of asphalt, concrete, bricks and rubble to manufacture a range of recycled aggregates and recycled asphalt products. Recycling C&D material provides a diversion of waste from landfills including:

- The reuse of steel from concrete
- Conservation of resources through extending the life of quarries
- Full lifecycle of materials from demolition through to re-supply to site for construction
- Making the best use of the embodied carbon of materials
- Reducing landfill usage (and associated greenhouse gas emissions)

This EPD covers a single product from one ResourceCo site.

ResourceCo maintains ISO certification for Quality, Safety and environmental management systems.

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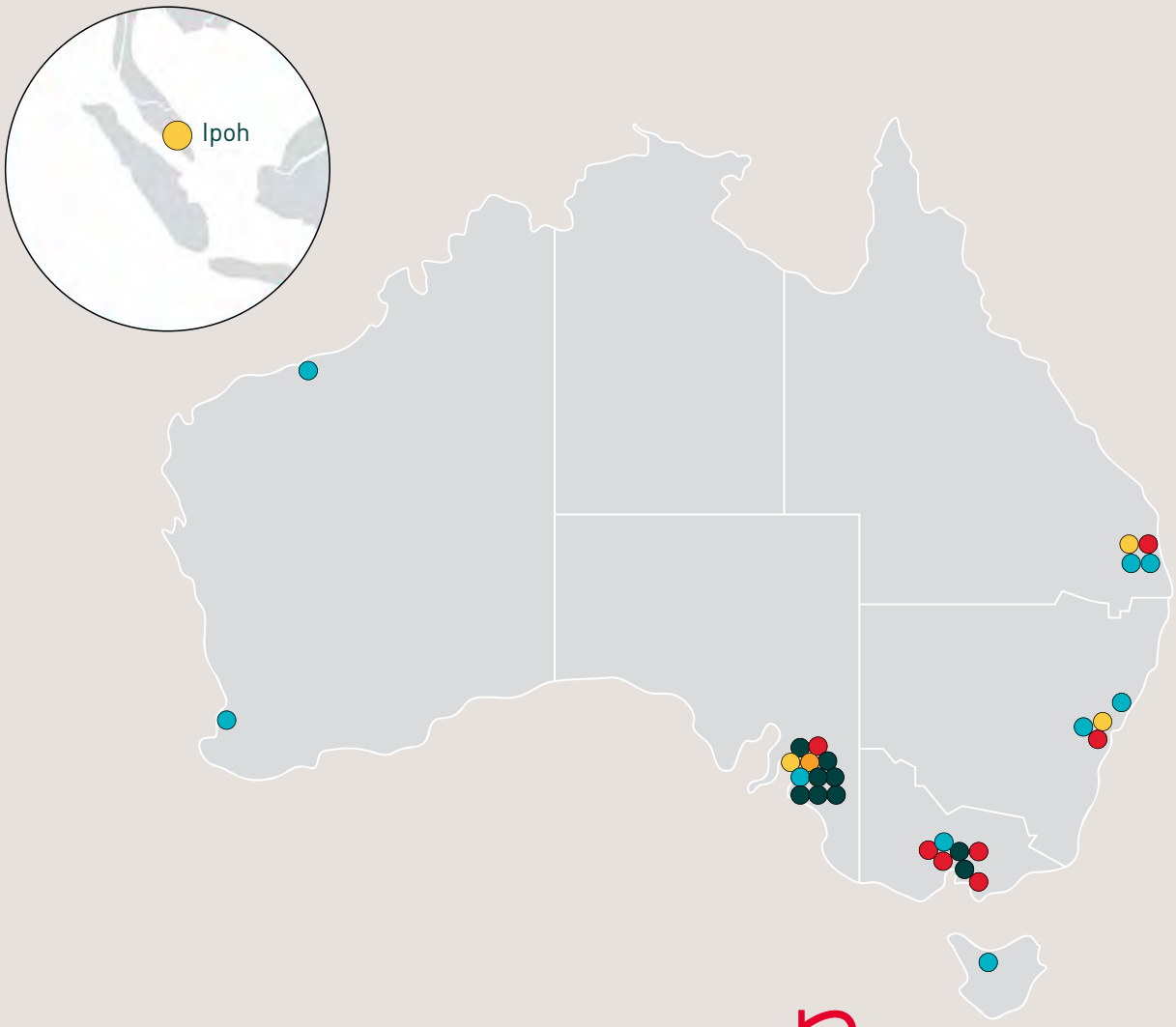
Operating locations

ResourceCo operates at locations in Australia and Asia across five business pillars: Tyre Recycling, Recycling & Waste, Soil Reuse & Recycling, Energy and Shared Services.



TYRE RECYCLING | RECYCLING & WASTE | SOIL REUSE & RECYCLING | ENERGY | SHARED SERVICES

Production site

SOUTH AUSTRALIA

WINGFIELD
RECYCLING FACILITY

144 – 150 Wingfield Road, Wingfield, SA, 5013

Product information

This EPD covers one aggregate/sand product (-7mm recycled sand) produced by ResourceCo at the Wingfield facility in South Australia. Products produced at Wingfield are consistent and produced from the same 'waste' feedstock.

PRODUCT	CODE
-7MM RECYCLED SAND	-7 MM SAND

ResourceCo's recycled products are produced to meet the requirements of various construction a transport uses. ResourceCo's recycled products can also be brought back to ResourceCo facilities at the end of their useful life and recycled further into more recycled products.

-7MM SAND

APPLICATIONS:

This product is used as packing sand for trench work and as under floor or engineered fill. It is suitable for under concrete or pavers and performs as a suitable substitute for quarried sands.

TABLE 1: INDUSTRY CLASSIFICATION

PRODUCT	CLASSIFICATION	CODE	CATEGORY
AGGREGATES AND SAND PRODUCTS	UN CPC VER.2	89420	NON-METAL WASTE AND SCRAP RECOVERY (RECYCLING) SERVICES, ON A FEE OR CONTRACT BASIS
	ANZSIC 2006	2922P	WASTE REMEDIATION AND MATERIALS RECOVERY SERVICES (OR 292 WASTE TREATMENT, DISPOSAL AND REMEDIATION SERVICES)

TABLE 2: TECHNICAL SPECIFICATIONS

PRODUCT	STATE	RELEVANT STANDARDS
AGGREGATES AND SAND PRODUCTS	SOUTH AUST.	RD-PV-S1 SUPPLY OF PAVEMENT MATERIALS (SA DEPARTMENT OF INFRASTRUCTURE AND TRANSPORT)
		TS 0631 – FINE MATERIALS FOR PIPE EMBEDMENT (SA WATER)

TABLE 3: PRODUCT COVERED BY THIS EPD

LOCATION	PRODUCT
WINGFIELD, SA	-7MM RECYCLED SAND

This EPD shows results that are product specific. Averaging (grouping) has not been performed in product or site level.

DECLARED UNIT

ISO 14040 defines a functional unit as "quantified performance of a product system for use as a reference unit". EPDs that do not cover the full product life cycle from raw material extraction through to end-of-life use the term "declared unit" instead.

The declared unit is one tonne of aggregate.

TABLE 4: CONTENT DECLARATION

PRODUCT COMPONENTS	-7 MM RECYCLED SAND	**POST-CONSUMER RECYCLED MATERIAL**	**BIOGENIC MATERIAL**
	WEIGHT KG	WEIGHT %	WEIGHT % & KG C/KG
RECYCLED CONCRETE		100%	0% RESP. 0
RECYCLED NATURAL OR MANUFACTURED SAND		100%	0% RESP. 0
RECYCLED ASPHALT		100%	0% RESP. 0
RECYCLED BASALT ROCK		100%	0% RESP. 0
RECYCLED BRICK & PAVERS		100%	0% RESP. 0
MIXED CONCRETE, BRICK, PAVERS, SOIL	1 000	100%	0% RESP. 0
TOTAL	1 000		0% RESP. 0

Dangerous substances from the candidate list of SVHC for Authorisation

None of the materials in this EPD are 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.

Manufacturing process

The processing for all products covered by this EPD are consistent, with various products produced during the same processing circuit.

1

INCOMING RAW MATERIAL (MODULE A1)

ResourceCo receives construction and demolition, commercial and industrial and mixed construction and demolition waste streams, which includes concrete, bricks, asphalt and masonry totalling around 1.2 million tonnes per annum.

2

PROCESSING (MODULE A3)

This material is sorted and the ferrous and non-ferrous metals, inert fractions (bricks, concrete, asphalt, masonry etc) and non-recyclables are separated.

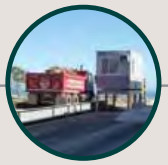
3

OUTGOING FINISHED PRODUCT (MODULE A3)

The inert fractions are recycled and resupplied to the civil construction market as an alternative to traditional quarried products: eg. recycled pavement materials, aggregates, sands, bulk fills & asphalt products at various facilities.

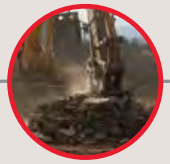
End users: builders, earthmovers, landscapers, civil companies.

Waste Material Delivered (Module A2)

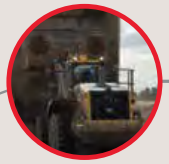


Weighbridge (Module A3)

Quality Inspection



Pulverisor



Primary Jaw

Picking Station

Control Room

Crushing Plant

Screen

Customer Dispatch

Pugmill or Stockpile

System boundaries

As shown in the table (right), this EPD is of the type D 'Cradle to gate (A1–A3)'. The production stage (Modules A1-A3) includes all aspects of recycled aggregate production from cradle to gate, utilising elementary and product flows. Other life cycle stages (Modules A4-A5, B1-B7, C1-C4, and D) are dependent on particular scenarios and best modelled at the building or construction level.

For scope of 'cradle-to-gate (A1-A3), three conditions must be met:
- the product or material is physically integrated with other products during installation so they cannot be physically separated from them at end of life,
- the product or material is no longer identifiable at end of life as a result of a physical or chemical transformation process, and
- the product or material does not contain biogenic carbon.

As ResourceCo products are to be integrated in construction products and assemblies (e.g. concrete and asphalt), they meet the first two criteria. The products also do not contain biogenic carbon as presented in the content declaration.

TABLE 5: 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 TO CUSTOMER	CONSTRUCTION / INSTALLATION	USE	MAINTENANCE	REPAIR	REPLACEMENT	REFURBISHMENT	OPERATIONAL ENERGY USE	OPERATIONAL WATER USE	DECONSTRUCTION / DEMOLITION	TRANSPORT TO WASTE PROCESSING	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GEOGRAPHY	AU	AU	AU														
SPECIFIC DATA	>90%					-	-	-	-	-	-	-	-	-	-	-	-
VARIATION: PRODUCTS	0%					-	-	-	-	-	-	-	-	-	-	-	-
VARIATION: SITES	0%					-	-	-	-	-	-	-	-	-	-	-	-

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

Three conditions must be met for type D EPD:

- The product or material is physically integrated with other products during installation so they cannot be physically separated from them at end of life,
- The product or material is no longer identifiable at end of life as a result of a physical or chemical transformation process, and
- The product or material does not contain biogenic carbon.

As ResourceCo products are to be integrated in construction products and assemblies (e.g. concrete and asphalt), they meet the first two criteria. The products also do not contain biogenic carbon as presented in the content declaration.

The processes below are included in the product system to be studied. For modules beyond A3, the scenarios included are currently in use and are representative for one of the most probable alternatives.

Product stage (Modules A1-A3)

RAW MATERIAL SUPPLY (A1)

ResourceCo processes Construction and Demolition (C&D) waste materials in South Australia (SA), consisting of asphalt, concrete, bricks, and rubble. This waste is then used to manufacture a range of recycled aggregates products. As per the polluter-pays principle, "processes of waste processing shall be assigned to the product system that generates the waste until the end-of-waste state is reached" (CEN, 2019). Hence, ResourceCo becomes responsible for environmental impacts of the material that reaches the end-of-life state at its boundaries. That is to say that waste feedstock is received free of impacts, and materials sent to energy generation are not part of ResourceCo boundaries.

ResourceCo also used some processing materials and fuels, such as, dust control agents and diesel. These materials are considered to be produced in Australia.

TRANSPORT (A2)

There are several small inputs that are needed to run the manufacturing plant and the raw material supply for these is included. Transport (A2) of the C&D waste is paid for by demolition companies, and ResoureCo becomes responsible for the environmental burden once it is deposited at its sites. Transport (A2) of auxiliaries and fuels are part of the assessment. The distance of transport for fuels and lubricants is up to 35 km. Dust suppressant is produced in Melbourne and is transport 720 km to South Australia.

2.4.3. MANUFACTURING (A3)

ResourceCo receives C&D waste from several sites close to the recycling facilities. The material is either dropped for free or received under a small fee. The C&D waste includes concrete, bricks, asphalt, masonry, and rubble from earthworks.

At the recycling facility, the C&D waste are weighted in a weighbridge. The initial sorting gives three streams: ferrous, non-ferrous (bricks, concrete, asphalt, masonry, etc), and non-recyclables. Ferrous materials are sold as scrap and non-recyclables are sent to landfill (inert materials) or incineration to energy production (wood and plastics).

Non-ferrous materials are then sent to the crushing and screening steps. Following this, they undergo grading and sorting based on their size. Different size fractions, including coarse aggregates, fine aggregates, and fill materials, are categorised. This grading process is crucial to ensure that the recycled aggregates conform to specific size and quality standards suitable for their intended use in construction projects. Sorted products are stocked in pugmills or stockpiles before customer dispatch.

Water is mostly used for dust control. Dust control is also aided with a dust control agent. Some water is also used in washing step of some of the aggregates. As there is no water measurement for the washing step, water is allocated as the other overheads.

Recycling and recycled inputs

Construction and demolition (C&D) waste inputs, consisting of asphalt, concrete, bricks, and rubble, are based on the cut-off approach. This waste is then used to manufacture a range of recycled aggregates products. As per the polluter-pays principle, "processes of waste processing shall be assigned to the product system that generates the waste until the end-of-waste state is reached" (CEN, 2019) and in the case of secondary use of material, "the system boundary between the system under study and the previous system (...) is set where outputs of the previous system (...) reach the end-of-waste state" (CEN, 2019). Hence, ResourceCo becomes responsible for environmental impacts of the material that reaches the end-of-life state at its boundaries. That is to say that waste sent to energy generation is not part of ResourceCo boundaries.

Life cycle inventory

(LCI) data and assumptions

Primary data were used for all manufacturing operations up to the plant gate, including upstream data for inputs. Primary data for ResourceCo operations were sourced for the calendar year 2022 (from 2022-01-01 to 2022-12-31).

All secondary data come from MCL Database 2023.1 (Sphera, 2023) and are representative of the years 2019-2022. As the study intended to compare the production systems for the reference year 2022, all background data fall within the 10-year limit allowable for generic data under EN 15804.

UPSTREAM DATA

Australia-specific datasets have been used where available, including South Australia electricity mix and Australian diesel. Other inputs such as dust suppressant and lubricant are based on Australian datasets. Water inputs are regionalised for Australia.

The upstream production impacts for materials used in the aggregates production were calculated based on the quantities in the BOM, uplifted for any production waste, and using dataset-specific impacts extracted from Sphera databases.

LCA SOFTWARE AND DATABASE

The LCA model was created using the Life Cycle for Experts (LCA FE) v10.7.0.183 (formerly known as GaBi Software) for life cycle engineering, developed by Sphera Solutions, Inc. The Managed LCA Content (MLC) database v2023.1 (Sphera, 2023) (formerly known as GaBi LCI database) provides the life cycle inventory data for several of the raw and process materials obtained from the background system.

ELECTRICITY

The composition of the electricity grid mix was modelled in LCA for Experts. PCR 2019:14 v1.3.3 determines the modelling of electricity to be based on residual electricity mix (REM) in the lack of guarantee of origin. However, since no information exists on REM composition in Australia or Australian state/territory level, electricity was modelled based on the worst-case scenario at Australian level. Worst case scenario means that all renewables were removed from the electricity modelling. The source of electricity of the Australian grid without renewables is 53.9% black coal, 17.3% brown coal, 26.3% natural gas, 2.5% heavy fuel oil. The emission factor for the Australian grid mix for the GWP-GHG indicator is 0.999 kg CO2-eq/kWh.

Note that ResourceCo Aggregates are produced in South Australia, which has an electricity mix with +60% share of renewables. Results presented in this EPD are likely overestimating the environmental burden of ResourceCo Aggregates due to the electricity modelling limitation.

SCRAP

C&D waste as received by ResourceCo contains ferrous materials. This material becomes useful at initial sorting and are sold as steel scrap – 100% of the scrap mixed in waste is assumed to be burden free as with the other C&D waste. Considering the previsions of allocation of waste in PCR 2019:2014 1.3.3, the end of waste of steel scrap is reached at ResouceCo's system. Hence, scrap is treated as co-product with allocation via an economic approach. The inputs of scrap contribute more than 10% to the GWP-GHG result of modules A1-A3. The GWP-GHG intensity of scrap is 116 kg of CO2-eq/t at Wingfield .

TRANSPORT

Customers deposit C&D waste at ResourceCo for free, and sometimes it is received under a small fee. As per the polluter-pay principle, transport of C&D waste is not included. Transport distances for all other inputs are up to 35 km for most inputs but up to 725 km for one auxiliary produced in Victoria. Transport for these cases ware estimated being road truck 20-26 t gross weight with 17.3 t payload capacity.

CUT OFF CRITERIA

Personnel is excluded as per section 4.3.2 of the PCR 2019:14 v1.3.3, published (EPD International, 2023). thinkstep-anz consistently excludes environmental impacts from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process, ('capital goods') regardless of potential significance.

High-quality infrastructure-related data isn't always available, and there is no clear cut-off for what to include. For this reason, capital goods data are applied to LCA studies inconsistently. This is expected to lead to reduced consistency and comparability of EPDs. Capital goods were previously excluded from EPDs, thus including capital goods in current EPDs would further reduce their comparability.

For the processes within the system boundary, C&D waste and its transport are cut offs, as explained above. However, all other energy and material flow data have been included in the model. In cases where no matching life cycle inventories are available to represent a flow, proxy data have been applied based on conservative assumptions regarding environmental impacts.

ALLOCATION

This EPD uses economic allocation for co-products. Multi-output allocation generally follows the requirements of ISO 14044, section 4.3.4.2. and the provision of PCR 2019:14 v1.3.3, section 4.5.1. ResourceCo shows a classical joint co-production process where it is not possible to divide the unit process per product. Although there is underlying physical relationship between co-products, the difference in revenue can be high. Hence, the third step of the provision of PCR 2019:14 v1.3.3 are followed, that is, economic allocation.

Allocation of background data (energy and materials) taken from the MLC databases is documented online: https://sphera.com/product-sustainability-gabi-data-search/

SCAN QR CODE

ASSUMPTIONS

Assumptions made during the LCI collection and modelling process are as follows:

Cut-off criteria, as per the PCR 2019:14 v1.3.3, are reasonable in the context of the overall impacts of recycled aggregates production.

Accuracy of data measurement falls within normal industrial weighing systems accuracy limits of ±10%. Hence, for mass balance of inputs and outputs, we assumed that total input of material (C&D waste) was equal to the total ResourceCo output (products, waste, and scrap).

Where specific life cycle inventory data were unavailable, proxy data were used, giving preference to regional data.

Use of any required secondary data from outside Australia is sufficiently representative of the impacts of the material.

Land use is modelled with occupation assumed to end in 2050 and using historical production to approximate annual production.

ResourceCo does not monitor dust emissions. The production equipment datasets include dust emissions based on the volume of material processed, and it is assumed these are a reasonable proxy.

Assessment indicators

The results tables describe the different environmental indicators for each product per declared unit, for each declared module. The EN 15804 reference package based on EF 3.0 is used. Indicators are from EF 3.0 package.

TABLE 6 contains the core environmental impact indicators in accordance with EN 15804:2012 +A2:2019/AC:2021 describing the potential environmental impacts of the product.

TABLE 7 shows the life cycle inventory indicators for resource use.

TABLE 8 displays the life cycle inventory indicators for waste and other outputs.

TABLE 9 provides additional environmental impact indicators in accordance with EN 15804:2012 +A2:2019/AC:2021. Indicators are from EF 3.0 package.

TABLE 10 displays biogenic carbon content indicators.

TABLE 11 contains results for environmental impact indicators in accordance with EN 15804:2012 +A1:2013 to aid backward comparability.

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Energy indicators (MJ) are always given as net calorific value.

TABLE 6: EN 15804:2012+A2:2019/AC:2021CORE ENVIRONMENTAL IMPACT INDICATORS

IMPACT CATEGORY	ABBREVIATION	UNIT
CLIMATE CHANGE – TOTAL	GWP-total	kg CO_2-eq.
CLIMATE CHANGE – FOSSIL	GWP-fossil	kg CO_2-eq.
CLIMATE CHANGE – BIOGENIC	GWP-biogenic	kg CO_2-eq.
CLIMATE CHANGE – LAND USE AND LAND USE CHANGE	GWP-luluc	kg CO_2-eq.
OZONE DEPLETION	ODP	kg CFC11-eq.
ACIDIFICATION	AP	Mole of H^+ eq.
EUTROPHICATION AQUATIC FRESHWATER	EP-freshwater	kg P eq.
EUTROPHICATION AQUATIC MARINE	EP-marine	kg N eq.
EUTROPHICATION TERRESTRIAL	EP-terrestrial	Mole of N eq.
PHOTOCHEMICAL OZONE FORMATION	POFP	kg NMVOC eq.
DEPLETION OF ABIOTIC RESOURCES – MINERALS AND METALS[1]	ADP-m&m	kg Sb-eq.
DEPLETION OF ABIOTIC RESOURCES – FOSSIL FUELS[1]	ADP-fossil	MJ
WATER USE[1]	WDP	m^3 world equiv.

TABLE 7: LIFE CYCLE INVENTORY INDICATORS ON USE OF RESOURCES

INDICATOR	ABBREVIATION	UNIT
USE OF RENEWABLE PRIMARY ENERGY EXCLUDING RENEWABLE PRIMARY ENERGY RESOURCES USED AS RAW MATERIALS	PERE	MJ
USE OF RENEWABLE PRIMARY ENERGY RESOURCES USED AS RAW MATERIALS	PERM	MJ
TOTAL USE OF RENEWABLE PRIMARY ENERGY RESOURCES	PERT	MJ
USE OF NON-RENEWABLE PRIMARY ENERGY EXCLUDINGNON-RENEWABLE PRIMARY ENERGY RESOURCES USED AS RAW MATERIALS	PENRE	MJ
USE OF NON-RENEWABLE PRIMARY ENERGY RESOURCES USED AS RAW MATERIALS	PENRM	MJ
TOTAL USE OF NON-RENEWABLE PRIMARY ENERGY RESOURCES	PENRT	MJ
USE OF SECONDARY MATERIAL;	SM	kg
USE OF RENEWABLE SECONDARY FUELS	RSF	MJ
USE OF NON-RENEWABLE SECONDARY FUELS	NRSF	MJ
TOTAL USE OF NET FRESH WATER	FW	m^3

TABLE 8: LIFE CYCLE INVENTORY INDICATORS ON WASTE CATEGORIES AND OUTPUT FLOWS

INDICATOR	ABBREVIATION	UNIT
HAZARDOUS WASTE DISPOSED	HWD	kg
NON-HAZARDOUS WASTE DISPOSED	NHWD	kg
RADIOACTIVE WASTE DISPOSED	RWD	kg
COMPONENTS FOR REUSE	CRU	kg
MATERIALS FOR ENERGY RECOVERY	MER	kg
MATERIALS FOR RECYCLING	MFR	kg
EXPORTED ELECTRICAL ENERGY	EEE	MJ
EXPORTED THERMAL ENERGY	EET	MJ

TABLE 9: EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

INDICATOR	ABBREVIATION	UNIT
CLIMATE CHANGE[2]	GWP-GHG	kg CO_2-eq.
PARTICULATE MATTER EMISSIONS	PM	DISEASE INCIDENCES
IONISING RADIATION – HUMAN HEALTH[3]	IRP	kBq U235 eq.
ECO-TOXICITY (FRESHWATER)[1]	ETP-fw	CTUe
HUMAN TOXICITY, CANCER[1]	HTP-c	CTUh
HUMAN TOXICITY, NON-CANCER[1]	HTP-nc	CTUh
LAND USE RELATED IMPACTS / SOIL QUALITY[1]	SQP	Pt

TABLE 10: BIOGENIC CARBON CONTENT INDICATORS

INDICATOR	ABBREVIATION	UNIT
BIOGENIC CARBON CONTENT - PRODUCT	BCC-prod	kg C
BIOGENIC CARBON CONTENT - PACKAGING	BCC-pack	kg C

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO^2

TABLE 11: EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS

INDICATOR	ABBREVIATION	UNIT
GLOBAL WARMING POTENTIAL	GWP (EN15804+A1)	kg CO_2-eq.
OZONE DEPLETION POTENTIAL	ODP (EN15804+A1)	kg CFC11-eq.
ACIDIFICATION POTENTIAL	AP (EN15804+A1)	kg SO_2-eq.
EUTROPHICATION POTENTIAL	EP (EN15804+A1)	kg PO_4^{3-} eq.
PHOTOCHEMICAL OZONE CREATION POTENTIAL	POCP (EN15804+A1)	kg C_2H_4-eq.
ABIOTIC DEPLETION POTENTIAL FOR NON-FOSSIL RESOURCES	ADPE (EN15804+A1)	kg Sb-eq.
ABIOTIC DEPLETION POTENTIAL FOR FOSSIL RESOURCES	ADPF (EN15804+A1)	MJ

Note: the indicators and characterisation methods used here are from EN 15804:2012+A1:2013, but other LCA rules (system boundaries, allocation, etc.) are according to EN 15804:2012+A2:2019.

[1] 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.

[2] This indicator is identical to GWP-total except that the CF for biogenic CO^2 is set to zero. It has been included in the EPD following the PCR.

[3] 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 some construction materials, is also not measured by this indicator.

The following indicators are not relevant, hence result in zero values:

- Components for re-use (CRU) is zero since there are none produced.
- Materials for energy recovery (MER) is zero since no credits are claimed for any incinerated wastes, applying the cut-off approach.
- Exported electrical energy (EEE) is zero since there is none produced.
- Exported thermal energy (EET) is zero since there is none produced.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Environmental performance

Wingfield (SA)

Results for one tonne of Recycled Aggregate at Wingfield (SA)

TABLE 12: EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS FOR A1-A3 AT WINGFIELD (SA)

PARAMETER	UNIT	-7MM SAND
GWP-total	kg CO_2 eq.	2.64
GWP-fossil	kg CO_2 eq.	2.63
GWP-biogenic	kg CO_2 eq.	0.00337
GWP-luluc	kg CO_2 eq.	0.00157
ODP	kg CFC 11 eq.	2.30E-13
AP	mol H^+ eq.	0.0179
EP-freshwater	kg P eq.	3.93E-06
EP-marine	kg N eq.	0.0727
EP-terrestrial	mol N eq.	0.0802
POCP	kg NMVOC eq.	0.0217
ADP-m&m	kg Sb eq.	1.41E-08
ADP-fossil	MJ	33.6
WDP	m^3 world eq. deprived	1.93

TABLE 13: USE OF RESOURCES FOR A1-A3 AT WINGFIELD (SA)

PARAMETER	UNIT	-7MM SAND
PERE	MJ	0.147
PERM	MJ	0
PERT	MJ	0.147
PENRE	MJ	33.6
PENRM	MJ	0
PENRT	MJ	33.6
SM	kg	1 000
RSF	MJ	0
NRSF	MJ	0
FWT	m^3	0.0574

TABLE 14: WASTE PRODUCTION AND OUTPUT FLOWS FOR A1-A3 AT WINGFIELD (SA)

PARAMETER	UNIT	-7MM SAND
HWD	kg	1.88E-06
NHWD	kg	0.00881
RWD	kg	5.68E-06
CRU	kg	0
MER	kg	0
MFR	kg	0.00786
EEE	MJ	0
EET	MJ	0

TABLE 15: EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS FOR A1-A3 AT WINGFIELD (SA)

PARAMETER	UNIT	-7MM SAND
GWP-GHG	kg CO_2-eq.	2.64
PM	Disease incidences	8.87E-08
IR	kBq U235 eq.	9.11E-04
ETP-fw	CTUe	11.7
HTP-c	CTUh	2.69E-09
HTP-nc	CTUh	1.35E-08
SQP	Dimensionless	0.850

TABLE 16: BIOGENIC CARBON CONTENT FOR A1-A3 AT WINGFIELD (SA)

PARAMETER	UNIT	-7 MM SAND
BCC-prod	kg C	0
BCC-pack	kg C	0

TABLE 17: EN15804+A1 ENVIRONMENTAL IMPACT INDICATOR FOR A1-A3 AT WINGFIELD (SA)

PARAMETER	UNIT	-7 MM SAND
GWP	kg CO_2 eq.	2.59
ODP	kg CFC-11 eq.	2.70E-13
AP	kg SO_2 eq.	0.0130
EP	kg PO_4^{3-} eq.	0.00248
POCP	kg C_2H_4 eq.	0.00134
ADPE	kg Sb eq.	1.41E-08
ADPF	MJ	33.5


ROL Forks
2370KG

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Sphera. (2023). Life Cycle Inventory Database 2023 Documentation. Retrieved from Sphera: https://sphera.com/product-sustainability-gabi-data-search/

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).

ResourceCo 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 within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same version number up to the first two digits) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison.

The results for EN15804+A1 compliant EPDs are not comparable with EN15804+A2 compliant studies as the methodologies are different. Results that are EN15804+A1 compliant are given in this document to assist comparability across EPDs.


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THINK, ACT, BE SAFE.
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PRODUCT CATEGORY RULES (PCR)

CEN standard EN 15804:2012+A2:2019/AC:2021 served as the core Product Category Rules (PCR)

Product Category Rules (PCR): PCR 2019.14 Construction Products, version 1.3.3 The Technical Committee of the International EPD® System.
See www.environdec.com for a list of members.

PCR review was conducted by:

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THIRD-PARTY VERIFICATION

Independent verification of the declaration and data, according to ISO 14025:2006, via:

☒ EPD verification by individual verifier

Third party verifier: Claudia Peña (Director of PINDA LCT SpA)
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Verifier approved by: EPD Australasia

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

☐ Yes ☒ No

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